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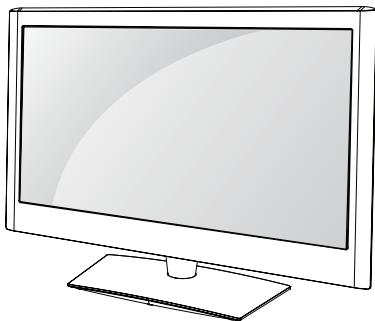
# LED LCD TV SERVICE MANUAL

CHASSIS : LJ01S

MODEL : 19LV2500 19LV2500-SA

## CAUTION

BEFORE SERVICING THE CHASSIS,  
READ THE SAFETY PRECAUTIONS IN THIS MANUAL.



P/NO : MFL62886945 (1103-REV01)

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# SAFETY PRECAUTIONS

## IMPORTANT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by  in the Schematic Diagram and Exploded View.

It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent Shock, Fire, or other Hazards.

Do not modify the original design without permission of manufacturer.

### General Guidance

An **isolation Transformer** should always be used during the servicing of a receiver whose chassis is not isolated from the AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks.

It will also protect the receiver and its components from being damaged by accidental shorts of the circuitry that may be inadvertently introduced during the service operation.

If any fuse (or Fusible Resistor) in this TV receiver is blown, replace it with the specified.

When replacing a high wattage resistor (Oxide Metal Film Resistor, over 1W), keep the resistor 10mm away from PCB.

Keep wires away from high voltage or high temperature parts.

### Before returning the receiver to the customer,

always perform an **AC leakage current check** on the exposed metallic parts of the cabinet, such as antennas, terminals, etc., to be sure the set is safe to operate without damage of electrical shock.

### Leakage Current Cold Check(Antenna Cold Check)

With the instrument AC plug removed from AC source, connect an electrical jumper across the two AC plug prongs. Place the AC switch in the on position, connect one lead of ohm-meter to the AC plug prongs tied together and touch other ohm-meter lead in turn to each exposed metallic parts such as antenna terminals, phone jacks, etc.

If the exposed metallic part has a return path to the chassis, the measured resistance should be between  $1M\Omega$  and  $5.2M\Omega$ .

When the exposed metal has no return path to the chassis the reading must be infinite.

An other abnormality exists that must be corrected before the receiver is returned to the customer.

### Leakage Current Hot Check (See below Figure)

Plug the AC cord directly into the AC outlet.

#### **Do not use a line Isolation Transformer during this check.**

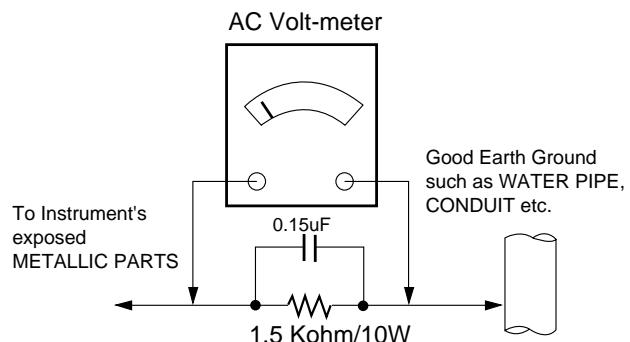
Connect 1.5K/10watt resistor in parallel with a 0.15uF capacitor between a known good earth ground (Water Pipe, Conduit, etc.) and the exposed metallic parts.

Measure the AC voltage across the resistor using AC voltmeter with 1000 ohms/volt or more sensitivity.

Reverse plug the AC cord into the AC outlet and repeat AC voltage measurements for each exposed metallic part. Any voltage measured must not exceed 0.75 volt RMS which corresponds to 0.5mA.

In case any measurement is out of the limits specified, there is possibility of shock hazard and the set must be checked and repaired before it is returned to the customer.

### Leakage Current Hot Check circuit



# SERVICING PRECAUTIONS

**CAUTION:** Before servicing receivers covered by this service manual and its supplements and addenda, read and follow the **SAFETY PRECAUTIONS** on page 3 of this publication.

**NOTE:** If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions on page 3 of this publication, always follow the safety precautions. Remember: Safety First.

## General Servicing Precautions

1. Always unplug the receiver AC power cord from the AC power source before;
  - a. Removing or reinstalling any component, circuit board module or any other receiver assembly.
  - b. Disconnecting or reconnecting any receiver electrical plug or other electrical connection.
  - c. Connecting a test substitute in parallel with an electrolytic capacitor in the receiver.

**CAUTION:** A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.
2. Test high voltage only by measuring it with an appropriate high voltage meter or other voltage measuring device (DVM, FETVOM, etc) equipped with a suitable high voltage probe.  
Do not test high voltage by "drawing an arc".
3. Do not spray chemicals on or near this receiver or any of its assemblies.
4. Unless specified otherwise in this service manual, clean electrical contacts only by applying the following mixture to the contacts with a pipe cleaner, cotton-tipped stick or comparable non-abrasive applicator; 10% (by volume) Acetone and 90% (by volume) isopropyl alcohol (90%-99% strength)  
**CAUTION:** This is a flammable mixture.  
Unless specified otherwise in this service manual, lubrication of contacts is not required.
5. Do not defeat any plug/socket B+ voltage interlocks with which receivers covered by this service manual might be equipped.
6. Do not apply AC power to this instrument and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.
7. Always connect the test receiver ground lead to the receiver chassis ground before connecting the test receiver positive lead.  
Always remove the test receiver ground lead last.
8. *Use with this receiver only the test fixtures specified in this service manual.*  
**CAUTION:** Do not connect the test fixture ground strap to any heat sink in this receiver.

## Electrostatically Sensitive (ES) Devices

Some semiconductor (solid-state) devices can be damaged easily by static electricity. Such components commonly are called **Electrostatically Sensitive (ES) Devices**. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by static by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed to prevent potential shock reasons prior to applying power to the

unit under test.

2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static type solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

**CAUTION:** Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device.)

## General Soldering Guidelines

1. Use a grounded-tip, low-wattage soldering iron and appropriate tip size and shape that will maintain tip temperature within the range of 500°F to 600°F.
2. Use an appropriate gauge of RMA resin-core solder composed of 60 parts tin/40 parts lead.
3. Keep the soldering iron tip clean and well tinned.
4. Thoroughly clean the surfaces to be soldered. Use a small wire-bristle (0.5 inch, or 1.25cm) brush with a metal handle.  
Do not use freon-propelled spray-on cleaners.
5. Use the following unsoldering technique
  - a. Allow the soldering iron tip to reach normal temperature. (500°F to 600°F)
  - b. Heat the component lead until the solder melts.
  - c. Quickly draw the melted solder with an anti-static, suction-type solder removal device or with solder braid.  
**CAUTION:** Work quickly to avoid overheating the circuit board printed foil.
6. Use the following soldering technique.
  - a. Allow the soldering iron tip to reach a normal temperature (500°F to 600°F)
  - b. First, hold the soldering iron tip and solder the strand against the component lead until the solder melts.
  - c. Quickly move the soldering iron tip to the junction of the component lead and the printed circuit foil, and hold it there only until the solder flows onto and around both the component lead and the foil.  
**CAUTION:** Work quickly to avoid overheating the circuit board printed foil.
  - d. Closely inspect the solder area and remove any excess or splashed solder with a small wire-bristle brush.

## **IC Remove/Replacement**

Some chassis circuit boards have slotted holes (oblong) through which the IC leads are inserted and then bent flat against the circuit foil. When holes are the slotted type, the following technique should be used to remove and replace the IC. When working with boards using the familiar round hole, use the standard technique as outlined in paragraphs 5 and 6 above.

### *Removal*

1. Desolder and straighten each IC lead in one operation by gently prying up on the lead with the soldering iron tip as the solder melts.
2. Draw away the melted solder with an anti-static suction-type solder removal device (or with solder braid) before removing the IC.

### *Replacement*

1. Carefully insert the replacement IC in the circuit board.
2. Carefully bend each IC lead against the circuit foil pad and solder it.
3. Clean the soldered areas with a small wire-bristle brush. (It is not necessary to reapply acrylic coating to the areas).

## **"Small-Signal" Discrete Transistor**

### **Removal/Replacement**

1. Remove the defective transistor by clipping its leads as close as possible to the component body.
2. Bend into a "U" shape the end of each of three leads remaining on the circuit board.
3. Bend into a "U" shape the replacement transistor leads.
4. Connect the replacement transistor leads to the corresponding leads extending from the circuit board and crimp the "U" with long nose pliers to insure metal to metal contact then solder each connection.

## **Power Output, Transistor Device**

### **Removal/Replacement**

1. Heat and remove all solder from around the transistor leads.
2. Remove the heat sink mounting screw (if so equipped).
3. Carefully remove the transistor from the heat sink of the circuit board.
4. Insert new transistor in the circuit board.
5. Solder each transistor lead, and clip off excess lead.
6. Replace heat sink.

### **Diode Removal/Replacement**

1. Remove defective diode by clipping its leads as close as possible to diode body.
2. Bend the two remaining leads perpendicular y to the circuit board.
3. Observing diode polarity, wrap each lead of the new diode around the corresponding lead on the circuit board.
4. Securely crimp each connection and solder it.
5. Inspect (on the circuit board copper side) the solder joints of the two "original" leads. If they are not shiny, reheat them and if necessary, apply additional solder.

## **Fuse and Conventional Resistor**

### **Removal/Replacement**

1. Clip each fuse or resistor lead at top of the circuit board hollow stake.
2. Securely crimp the leads of replacement component around notch at stake top.
3. Solder the connections.

**CAUTION:** Maintain original spacing between the replaced component and adjacent components and the circuit board to prevent excessive component temperatures.

## **Circuit Board Foil Repair**

Excessive heat applied to the copper foil of any printed circuit board will weaken the adhesive that bonds the foil to the circuit board causing the foil to separate from or "lift-off" the board. The following guidelines and procedures should be followed whenever this condition is encountered.

### *At IC Connections*

To repair a defective copper pattern at IC connections use the following procedure to install a jumper wire on the copper pattern side of the circuit board. (Use this technique only on IC connections).

1. Carefully remove the damaged copper pattern with a sharp knife. (Remove only as much copper as absolutely necessary).
2. carefully scratch away the solder resist and acrylic coating (if used) from the end of the remaining copper pattern.
3. Bend a small "U" in one end of a small gauge jumper wire and carefully crimp it around the IC pin. Solder the IC connection.
4. Route the jumper wire along the path of the out-away copper pattern and let it overlap the previously scraped end of the good copper pattern. Solder the overlapped area and clip off any excess jumper wire.

### *At Other Connections*

Use the following technique to repair the defective copper pattern at connections other than IC Pins. This technique involves the installation of a jumper wire on the component side of the circuit board.

1. Remove the defective copper pattern with a sharp knife. Remove at least 1/4 inch of copper, to ensure that a hazardous condition will not exist if the jumper wire opens.
2. Trace along the copper pattern from both sides of the pattern break and locate the nearest component that is directly connected to the affected copper pattern.
3. Connect insulated 20-gauge jumper wire from the lead of the nearest component on one side of the pattern break to the lead of the nearest component on the other side.  
Carefully crimp and solder the connections.

**CAUTION:** Be sure the insulated jumper wire is dressed so the it does not touch components or sharp edges.

# SPECIFICATION

NOTE : Specifications and others are subject to change without notice for improvement.

## 1. Application range

This spec sheet is applied LCD TV with LJ01T/S chassis.

## 2. Requirement for Test

Each part is tested as below without special appointment.

- 1) Temperature: 25 °C ± 5 °C
- 2) Relative Humidity: 65 ± 10 %
- 3) Power Voltage : Standard input voltage(100-240V~, 50/60Hz)  
\* Standard Voltage of each product is marked by models
- 4) Specification and performance of each parts are followed each drawing and specification by part number in accordance with BOM.
- 5) The receiver must be operated for about 5 minutes prior to the adjustment.

## 3. Test method

- 1) Performance: LGE TV test method followed
- 2) Demanded other specification
  - Safety : UL, CSA, IEC specification
  - EMC: FCC, ICES, IEC specification

## 4. General Specification(TV)

No	Item	Specification			Remark
1	Receivable System	1) SBT/NTSC/PAL-M/PAL-N			
2	Available Channel	1) VHF : 02 ~ 13 2) UHF : 14 ~ 69 3) DTV : 07 ~ 69 4) CATV : 01 ~ 135			
3	Input Voltage	1) AC 100 - 240V~ 50/60Hz			
4	Market	Central and South AMERICA			
5	Screen Size	19 inch Wide (1366 x 768)		19LV2500	
		22 inch Wide (1366 x 768)		22LV2500	
		26 inch Wide (1366 x 768)		26LV2500	
6	Aspect Ratio	16:9			
7	Tuning System	FS			
8	LCD Module	M185WX01-VD	HD, 60Hz	AUO	19LV2500
		M185BGE-L10	HD, 60Hz	CMI	19LV2500
		LC185EXN-SDA1	HD, 60Hz	LGD	19LV2500
				CMI	22LV2500
		T260XW 6-V3	HD, 60Hz	AUO	26LV2500
		LC260EXN-SDA1	HD, 60Hz	LGD	26LV2500
9	Operating Environment	Temp : 0 ~ 40 deg Humidity : ~ 80 %			
10	Storage Environment	Temp : -20 ~ 60 deg Humidity : -85 %			

## 5. Chrominance & Luminance(19LV2500-SA)

No	Item		Min	Typ	Max	Unit	Remark	
1	(Center 1-point / Full White Pattern)		Module	200	250		cd/m <sup>2</sup>	
			SET	150	300		cd/m <sup>2</sup>	
2	Luminance uniformity		77					
3	Color coordinate	RED	X	Typ. -0.03	0.634	Typ. +0.03	LGD	
					0.644		CMI	
					0.634		AUO	
			Y		0.339		LGD	
					0.343		CMI	
					0.351		AUO	
		GREEN	X	Typ. -0.03	0.320	Typ. +0.03	LGD	
					0.311		CMI	
					0.334		AUO	
			Y		0.608		LGD	
					0.617		CMI	
					0.605		AUO	
		BLUE	X	Typ. -0.03	0.155	Typ. +0.03	LGD	
					0.152		CMI	
					0.146		AUO	
			Y		0.050		LGD	
					0.064		CMI	
					0.059		AUO	
		WHITE	X	Typ. -0.03	0.279	Typ. +0.03	LGD	
					0.313		CMI	
					0.313		AUO	
			Y		0.292		LGD	
					0.329		CMI	
					0.329		AUO	
3.	Contrast ratio		700	1000			LGD/CMI	
			600	1000			CMI	
4.	Color Temperature	Cool	0.254	0.269	0.284	<Test Condition> * The W/B Tolerance is ± 0.015 for Adjustment		
			0.258	0.273	0.288			
		Standard	0.270	0.285	0.300			
			0.278	0.293	0.308			
		Warm	0.298	0.313	0.324			
			0.314	0.329	0.344			

## 6. Component Video Input (Y, C<sub>B</sub>/P<sub>B</sub>, C<sub>R</sub>/P<sub>R</sub>)

No	Resolution	H-freq(kHz)	V-freq.(kHz)	Pixel clock	Proposed
1.	720*576	15.625	50.000	13.5	SDTV 576I
2.	720*480	15.73	60	13.5135	SDTV ,DVD 480I
3.	720*480	15.73	59.94	13.5	SDTV ,DVD 480I
4.	720*480	31.50	60	27.027	SDTV 480P
5.	720*480	31.47	59.94	27.0	SDTV 480P
6.	720*576	31.250	50.000	27.000	SDTV 576P
7.	1280*720	37.500	50.000	74.25	HDTV 720P
8.	1280*720	45.00	60.00	74.25	HDTV 720P
9.	1280*720	44.96	59.94	74.176	HDTV 720P
10.	1920*1080	28.125	50.00	74.250	HDTV 1080I
11.	1920*1080	33.75	60.00	74.25	HDTV 1080I
12.	1920*1080	33.72	59.94	74.176	HDTV 1080I
13.	1920*1080	56.250	50.00	148.50	HDTV 1080P
14.	1920*1080	67.500	60	148.50	HDTV 1080P
15.	1920*1080	67.432	59.94	148.352	HDTV 1080P
16.	1920*1080	27.000	24.000	74.25	HDTV 1080P
17.	1920*1080	26.97	23.976	74.176	HDTV 1080P
18.	1920*1080	33.75	30.000	74.25	HDTV 1080P
19.	1920*1080	33.71	29.97	740176	HDTV 1080P

## 7. RGB Input (PC)

No	Resolution	H-freq(kHz)	V-freq.(kHz)	Pixel clock	Proposed	
					DDC	
1.	640*350	31.468	70.09	25.17	EGA	X
2.	720*400	31.469	70.08	28.32	DOS	O
3.	640*480	31.469	59.94	25.17	VESA(VGA)	O
4.	800*600	37.879	60.31	40.00	VESA(SVGA)	O
5.	1024*768	48.363	60.00	65.00	VESA(XGA)	O
6.	1280*768	47.78	59.870	79.5	CVT(WXGA)	O
7.	1360*768	47.712	60.015	85.50	VESA(WXGA)	O
8.	1280*1024	63.981	60.020	108.00	VESA(SXGA)	O
9.	1920*1080	67.5	60	148.5	HDTV 1080P	O

•RGB PC Monitor Range Limits

Min Vertical Freq - 58 Hz  
 Max Vertical Freq - 62 Hz  
 Min Horiz. Freq - 30 kHz  
 Max Horiz. Freq - 83 kHz  
 Pixel Clock - 160 MHz

## 8. HDMI input (PC/DTV)

No	Resolution	H-freq(kHz)	V-freq.(kHz)	Pixel clock	Proposed	
					DDC	
1.	640*350	31.468	70.09	25.17	EGA	X
2.	720*400	31.469	70.08	28.32	DOS	O
3.	640*480	31.469	59.94	25.17	VESA(VGA)	O
4.	800*600	37.879	60.31	40.00	VESA(SVGA)	O
5.	1024*768	48.363	60.00	65.00	VESA(XGA)	O
6.	1360*768	47.712	60.015	85.50	VESA (WXGA)	O
7.	1280*1024	63.981	60.020	108.00	VESA (SXGA)	O
8.	1920*1080	67.500	60.000	148.50	HDTV 1080P	O
	DTV					
1	720*480	31.469	59.940	27.000	SDTV 480P	
2	720*480	31.500	60	27.027	SDTV 480P	
3	720*576	31.250	50.000	27.000	SDTV 576P	
4	1280*720	37.500	50.000	74.25	HDTV 720P	
5	1280*720	45.00	60.00	74.25	HDTV 720P	
6	1280*720	44.96	59.94	74.176	HDTV 720P	
7	1920*1080	28.125	50.000	74.25	HDTV 1080I	
8	1920*1080	33.75	60.00	74.25	HDTV 1080I	
9	1920*1080	33.72	59.94	74.176	HDTV 1080I	
10	1920*1080	56.250	50.000	148.50	HDTV 1080P	
11	1920*1080	67.500	60	148.50	HDTV 1080P	
12	1920*1080	67.432	59.94	148.352	HDTV 1080P	
13	1920*1080	27.000	24.000	74.25	HDTV 1080P	
14	1920*1080	26.97	23.976	74.176	HDTV 1080P	
15	1920*1080	33.75	30.000	74.25	HDTV 1080P	
16	1920*1080	33.71	29.97	74.176	HDTV 1080P	

•HDMI Monitor Range Limits

Min Vertical Freq - 58 Hz

Min Horiz. Freq - 30 kHz

Pixel Clock - 160 MHz

Max Vertical Freq - 62 Hz

Max Horiz. Freq - 83 kHz

# ADJUSTMENT INSTRUCTION

## 1. Application Range

This specification sheet is applied to all of the LCD TV with LJ01U/LJ01T/LJ01S chassis.

## 2. Designation

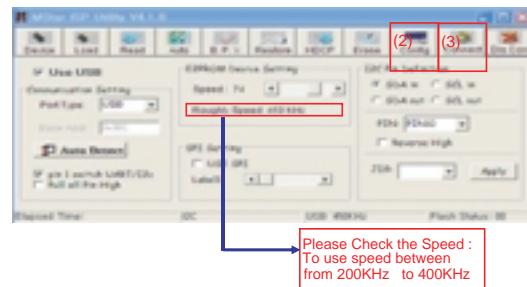
- 1) The adjustment is according to the order which is designated and which must be followed, according to the plan which can be changed only on agreeing.
- 2) Power Adjustment: Free Voltage
- 3) Magnetic Field Condition: Nil.
- 4) Input signal Unit: Product Specification Standard
- 5) Reserve after operation: Above 5 Minutes (Heat Run)
  - Temperature : at 25 °C ± 5 °C
  - Relative humidity : 65 % ± 10 %
  - Input voltage : 100 ~ 220 V~, 50/60 Hz
- 6) Adjustment equipments: Color Analyzer(CA-210 or CA-110), DDC Adjustment Jig equipment, Service remote control.
- 7) Push the "IN STOP" key - For memory initialization.

Case1 : Software version up

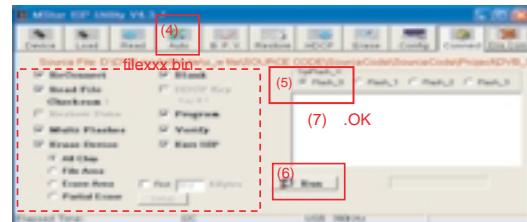
1. After downloading S/W by USB, TV set will reboot automatically
2. Push "In-stop" key
3. Push "Power on" key
4. Function inspection
5. After function inspection, Push "In-stop" key.

Case2 : Function check at the assembly line

1. When TV set is entering on the assembly line, Push "In-stop" key at first.
2. Push "Power on" key for turning it on.  
-> If you push "Power on" key, TV set will recover channel information by itself.
3. After function inspection, Push "In-stop" key.

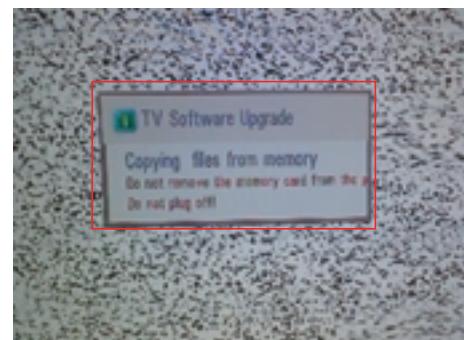


- 5) Click "Auto" tab and set as below
- 6) Click "Run".
- 7) After downloading, check "OK" message.

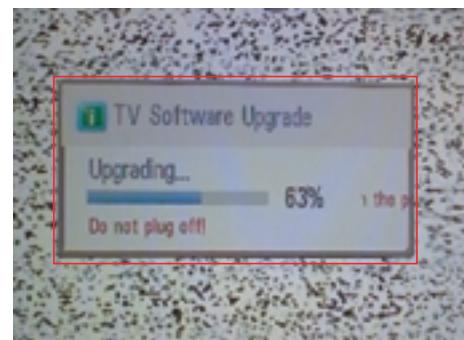


### \* USB DOWNLOAD

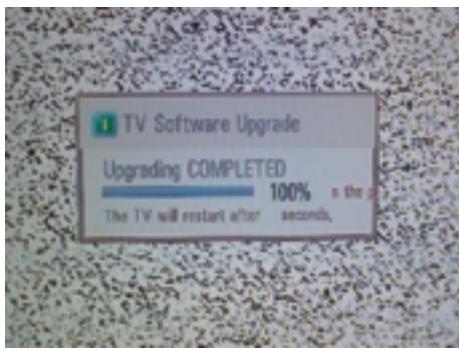
- 1) Put the USB Stick to the USB socket
- 2) Automatically detecting update file in USB Stick
  - If your downloaded program version in USB Stick is Low, it didn't work. But your downloaded version is High, USB data is automatically detecting
- 3) Show the message "Copying files from memory"



- 4) Updating is staring.



- 2) Set as below, and then click "Auto Detect" and check "OK" message  
If "Error" is displayed, Check connection between computer, jig, and set.
- 3) Click "Read" tab, and then load download file (XXXX.bin) by clicking "Read"
- 4) Click "Connect" tab. If "Can't" is displayed, check connection between computer, jig, and set.



5) Uploading completed, The TV will restart automatically.  
 6) If your TV is turned on, check your updated version and Tool option.(explain the Tool option, next stage)  
 \* If downloading version is more high than your TV have, TV can lost all channel data. In this case, you have to channel recover. if all channel data is cleared, you didn't have a DTV/ATV test on production line.

**\* After downloading, have to adjust Tool Option again.**

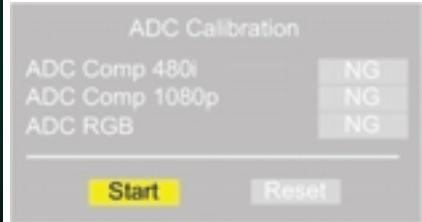
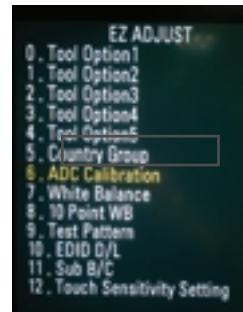
- 1) Push "IN-START" key in service remote control.
- 2) Select "Tool Option 1" and Push "OK" button.
- 3) Punch in the number. (Each model has their number)
- 4) Completed selecting Tool option.

Module	Module	Tool option1	Tool option2	Tool option3	Tool option4	Tool option5
42LV4500-SA	LGD	26496	19478	55337	10520	8448
32LV4500-SA	LGD	18304	19478	55337	10520	8480
55LV3500-SA	LGD	46944	19478	55337	10520	8448
47LV3500-SA	LGD	34656	19478	55337	10520	256
42LV3500-SA	AUO	26472	19478	55337	10520	352
42LV3500-SA	LGD	26464	19478	55337	10520	288
37LV3500-SA	AUO	22376	19478	55337	10520	352
37LV3500-SA	LGD	22368	19478	55337	10520	288
32LV3500-SA	CMI	18276	19478	55337	10520	352
32LV3500-SA	AUO	18280	19478	55337	10520	352
32LV3500-SA	LGD	18272	19478	55337	10520	288
42LV3400-SA	LGD	26592	9226	53289	10520	288
32LV3400-SA	LGD	18400	9226	53289	10520	288
32LV2500-SA	CMI	18212	19478	55337	10520	352
32LV2500-SA	AUO	18216	19478	55337	10520	352
32LV2500-SA	LGD	18208	19478	55337	10520	288
26LV2500-SA	AUO	14120	8714	55337	10520	288
26LV2500-SA	LGD	14112	8714	55337	10520	288
22LV2500-SA	CMI	10020	8714	55337	10520	288
22LV2500-SA	AUO	10024	8714	55337	10520	288
19LV2500-SA	AUO	5928	8714	55337	10520	288
19LV2500-SA	CMI	5924	8714	55337	10520	288
19LV2500-SA	LGD	5920	8714	55337	10520	288
47LK450-SA	LGD	34432	18966	55305	10520	8450
42LK450-SA	LGD	26240	18966	55305	10520	8450
42LK450-SA	AUO	26248	18966	55305	10520	290
37LK450-SA	LGD	22144	18966	55305	10520	8450
37LK450-SA	AUO	22152	18966	55305	10520	290
32LK450-SA	AUO	18056	18966	55305	10520	290
32LK450-SA	LGD	18048	18966	55305	10520	8482
32LK450-SA	LGD (CoMS)	18048	18966	55305	10520	8450
32LK430-SA	AUO	18024	18966	51209	10520	290
32LK330-SB	AUO	17992	18966	51209	10520	290
32LK330-SB	LGD	17984	18966	51209	10520	290
32LK330-SB	LGD (CoMS)	17984	18966	51209	10520	258
26LK330-SB	AUO	13896	18966	51209	10520	290

### 3.1. ADC Process

#### (1) ADC

- Enter Service Mode by pushing "ADJ" key,
- Enter Internal ADC mode by pushing "G" key at "6. ADC Calibration"



<Caution> Using 'power on' button of the Adjustment R/C, power on TV.

#### \* ADC Calibration Protocol (RS232)

No	Item	CMD1	CMD2	Data0	
Enter Adjust Mode	Adjust 'Mode In'	A	A	0 0	When transfer the 'Mode In', Carry the command.
ADC adjust	ADC Adjust	A	D	1 0	Automatically adjustment (The use of a internal pattern)

#### Adjust Sequence

- aa 00 00 [Enter Adjust Mode]
- xb 00 40 [Component1 Input (480i)]
- ad 00 10 [Adjust 480i Comp1]
- xb 00 60 [RGB Input (1024\*768)]
- ad 00 10 [Adjust 1024\*768 RGB]
- aa 00 90 End Adjust mode

\* Required equipment : Adjustment R/C.

### 3.2. Function Check

#### \* Check display and sound

- Check Input and Signal items. (cf. work instructions)

- 1) TV
- 2) AV (SCART1/SCART2/ CVBS)
- 3) COMPONENT (480i)
- 4) RGB (PC : 1024 x 768 @ 60hz)
- 5) HDMI
- 6) PC Audio In

\* Display and Sound check is executed by Remote control.

## 4. Total Assembly line process

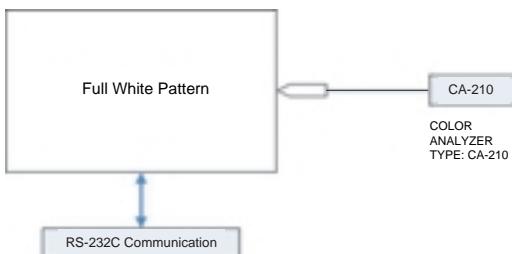
### 4.1. Adjustment Preparation

- W/B Equipment condition  
CA210 : CH 9, Test signal : Inner pattern (85IRE)
- Above 5 minutes H/run in the inner pattern. ("power on" key of adjust remote control)

Cool	13,000	K	X=0.269( $\pm 0.002$ ) Y=0.273( $\pm 0.002$ )	<Test Signal> Inner pattern (216gray,85IRE)
Medium	9,300	K	X=0.285( $\pm 0.002$ ) Y=0.293( $\pm 0.002$ )	
Warm	6,500	K	X=0.313( $\pm 0.002$ ) Y=0.329( $\pm 0.002$ )	

- \* Connecting picture of the measuring instrument  
(On Automatic control)

Inside PATTERN is used when W/B is controlled. Connect to auto controller or push Adjustment R/C POWER ON -> Enter the mode of White-Balance, the pattern will come out.



- \* Auto-control interface and directions

- Adjust in the place where the influx of light like floodlight around is blocked. (illumination is less than 10 lux).
- Adhere closely the Color Analyzer (CA210) to the module less than 10 cm distance, keep it with the surface of the Module and Color Analyzer's prove vertically.(80° ~ 100°).
- Aging time
  - After aging start, keep the power on (no suspension of power supply) and heat-run over 5 minutes.
  - Using 'no signal' or 'full white pattern' or the others, check the back light on.

- Auto adjustment Map(RS-232C)

#### RS-232C COMMAND

[CMD ID DATA]				White Balance Start			
				White Balance End			
Wb	00	00		Cool	172	192	192
Wb	00	ff		Mid	192	192	192
				Warm	64	64	128

	RS-232C COMMAND			MIN	CENTER			MAX
	[CMD ID DATA]				(DEFAULT)			
	Cool	Mid	Warm		Cool	Mid	Warm	
R Gain	jg	Ja	jd	00	172	192	192	192
G Gain	jh	Jb	je	00	172	192	192	192
B Gain	ji	Jc	jf	00	192	192	172	192
R Cut					64	64	64	128
G Cut					64	64	64	128
B Cut					64	64	64	128

#### <Caution>

Color Temperature : COOL, Medium, Warm.  
One of R Gain/G Gain/ B Gain should be kept on 0xC0, and adjust other two lower than C0.  
(when R/G/B Gain are all C0, it is the FULL Dynamic Range of Module)

#### \* Manual W/B process using adjusts Remote control.

- After enter Service Mode by pushing "ADJ" key,
- Enter White Balance by pushing "G" key at "6. White Balance".



- \* After done all adjustments, Press "In-start" button and compare Tool option and Area option value with its BOM, if it is correctly same then unplug the AC cable. If it is not same, then correct it same with BOM and unplug AC cable. For correct it to the model's module from factory Jig model.
- \* Push the "IN STOP" key after completing the function inspection. And Mechanical Power Switch must be set "ON".

### 4.2. DDC EDID Write (RGB 128Byte)

- Connect D-sub Signal Cable to D-sub Jack.
- Write EDID Data to EEPROM(24C02) by using DDC2B protocol.
- Check whether written EDID data is correct or not.
- \* For SVC main Assembly, EDID have to be downloaded to Insert Process in advance.

### 4.3. DDC EDID Write (HDMI 256Byte)

- Connect HDMI Signal Cable to HDMI Jack.
- Write EDID Data to EEPROM(24C02) by using DDC2B protocol.
- Check whether written EDID data is correct or not.
- \* For SVC main Assembly, EDID have to be downloaded to Insert Process in advance.

### 4.4. EDID DATA

- All Data : HEXA Value
- Changeable Data :
  - \*: Serial No : Controlled / Data:01
  - \*\*: Month : Controlled / Data:00
  - \*\*\*:Year : Controlled
  - \*\*\*\*:Check sum

## 4.5. Auto Download

- 1) Press Adj. key on the Adj. Remote control.
- 2) Select EDID D/L menu.
- 3) By pressing Enter key, EDID download will begin
- 4) If Download is successful, OK is display, but If Download if failure, NG is displayed.
- 5) If Download is failure, Re-try downloads.



\* Edid data and Model option download (RS232)

NO	Item	CMD1	CMD2	Data0	
Enter download Mode	Download 'Mode In'	A	A	0 0	When transfer the 'Mode In', Carry the command.
EDID data and Model option download	Download	A	E	00 10	Automatically Download (The use of a internal pattern)

## - Manual Download

- \* Caution
  - 1) Use the proper signal cable for EDID Download
    - Analog EDID : Pin3 exists
    - Digital EDID : Pin3 exists
  - 2) Never connect HDMI & D-sub Cable at the same time.
  - 3) Use the proper cables below for EDID Writing
  - 4) Download HDMI1, HDMI2, separately because HDMI1 is different from HDMI2



Item	Condition	Data(Hex)
Manufacturer ID	GSM	1E6D
Version	Digital : 1	01
Revision	Digital : 3	03

1) FHD RGB EDID data(Check sum:1C)

Addr	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
0000	00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
0010	01	15	01	03	68	10	09	78	0A	EE	91	A3	54	4C	99	26
0020	0F	50	54	A1	08	00	81	80	61	40	45	40	31	40	01	01
0030	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C	
0040	45	00	A0	5A	00	00	00	1E	1B	21	50	A0	51	00	1E	30
0050	48	88	35	00	A0	5A	00	00	00	1C	00	00	00	FD	00	3A
0060	3E	1E	53	10	00	0A	20	20	20	20	20	20	00	00	00	FC
0070	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	E2
0080	02	03	26	F1	4E	10	1F	84	13	05	14	03	02	12	20	21
0090	22	15	01	26	15	07	50	09	57	07	67	03	0C	00	10	00
00A0	BB	2D	E3	05	03	01	01	1D	80	18	71	1C	16	20	58	2C
00B0	25	00	A0	5A	00	00	00	9E	01	1D	00	72	51	D0	1E	20
00C0	6E	28	55	00	A0	5A	00	00	00	1E	02	3A	80	18	71	38
00D0	2D	40	58	2C	45	00	A0	5A	00	00	00	1E	01	1D	00	BC
00E0	52	D0	1E	20	B8	28	55	40	A0	5A	00	00	00	1E	00	00
00F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	99

2) FHD HDMI EDID data  
HDMI 1 (Check sum:E2, 99)

Addr	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
0000	00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
0010	01	15	01	03	80	10	09	78	0A	EE	91	A3	54	4C	99	26
0020	0F	50	54	A1	08	00	71	4F	01	00	01	01	01	01	01	01
0030	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C	
0040	45	00	A0	5A	00	00	00	1E	1B	21	50	A0	51	00	1E	30
0050	48	88	35	00	A0	5A	00	00	00	1C	00	00	00	FD	00	3A
0060	3E	1E	53	10	00	0A	20	20	20	20	20	20	00	00	00	FC
0070	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	E2
0080	02	03	26	F1	4E	10	1F	84	13	05	14	03	02	12	20	21
0090	22	15	01	26	15	07	50	09	57	07	67	03	0C	00	20	00
00A0	BB	2D	E3	05	03	01	01	1D	80	18	71	1C	16	20	58	2C
00B0	25	00	A0	5A	00	00	00	9E	01	1D	00	72	51	D0	1E	20
00C0	6E	28	55	00	A0	5A	00	00	00	1E	02	3A	80	18	71	38
00D0	2D	40	58	2C	45	00	A0	5A	00	00	00	1E	01	1D	00	BC
00E0	52	D0	1E	20	B8	28	55	40	A0	5A	00	00	00	1E	00	00
00F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	99

HDMI 2 (Check sum:E2, 89)

Addr	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
0000	00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
0010	01	15	01	03	80	10	09	78	0A	EE	91	A3	54	4C	99	26
0020	0F	50	54	A1	08	00	71	4F	01	00	01	01	01	01	01	01
0030	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C	
0040	45	00	A0	5A	00	00	00	1E	1B	21	50	A0	51	00	1E	30
0050	48	88	35	00	A0	5A	00	00	00	1C	00	00	00	FD	00	3A
0060	3E	1E	53	10	00	0A	20	20	20	20	20	20	00	00	00	FC
0070	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	E2
0080	02	03	26	F1	4E	10	1F	84	13	05	14	03	02	12	20	21
0090	22	15	01	26	15	07	50	09	57	07	67	03	0C	00	30	00
00A0	BB	2D	E3	05	03	01	01	1D	80	18	71	1C	16	20	58	2C
00B0	25	00	A0	5A	00	00	00	9E	01	1D	00	72	51	D0	1E	20
00C0	6E	28	55	00	A0	5A	00	00	00	1E	02	3A	80	18	71	38
00D0	2D	40	58	2C	45	00	A0	5A	00	00	00	1E	01	1D	00	BC
00E0	52	D0	1E	20	B8	28	55	40	A0	5A	00	00	00	1E	00	00
00F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	99

HDMI 3 (Check sum:E2, 79)

Addr	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
0000	00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
0010	01	15	01	03	80	10	09	78	0A	EE	91	A3	54	4C	99	26
0020	0F	50	54	A1	08	00	71	4F	01	00	01	01	01	01	01	01
0030	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C	
0040	45	00	A0	5A	00	00	00	1E	1B	21	50	A0	51	00	1E	30
0050	48	88	35	00	A0	5A	00	00	00	1C	00	00	00	FD	00	3A
0060	3E	1E	53	10	00	0A	20	20	20	20	20	20	00	00	00	FC
0070	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	E2
0080	02	03	26	F1	4E	10	1F	84	13	05	14	03	02	12	20	21
0090	22	15	01	26	15	07	50	09	57	07	67	03	0C	00	30	00
00A0	BB	2D	E3	05	03	01	01	1D	80	18	71	1C	16	20	58	2C
00B0	25	00	A0	5A	00	00	00	9E	01	1D	00	72	51	D0	1E	20
00C0	6E	28	55	00	A0	5A	00	00	00	1E	02	3A	80	18	71	38
00D0	2D	40	58	2C	45	00	A0	5A	00	00	00	1E	01	1D	00	BC
00E0	52	D0	1E	20	B8	28	55	40	A0	5A						

### 3) HD RGB EDID data(Check sum:CD)

Addr	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
0000	00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
0010	01	15	01	03	80	10	09	78	0A	EE	91	A3	54	4C	99	26
0020	0F	50	54	A1	08	00	81	C0	61	40	45	40	31	40	01	01
0030	01	01	01	01	01	1B	21	50	A0	51	00	1E	30	48	88	
0040	35	00	A0	5A	00	00	00	1C	01	1D	00	72	51	D0	1E	20
0050	6E	28	55	00	A0	5A	00	00	00	1E	00	00	00	FD	00	3A
0060	3E	1F	46	10	00	0A	20	20	20	20	20	20	20	00	00	FC
0070	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	B4
0080	02	03	20	F1	4E	10	1F	84	13	05	14	03	02	12	20	21
0090	22	15	01	26	15	07	50	09	57	07	65	03	0C	00	10	00
00A0	01	1D	80	18	71	1C	16	20	58	2C	25	00	A0	5A	00	00
00B0	00	9E	01	1D	00	80	51	D0	0C	20	40	80	35	00	A0	5A
00C0	00	00	00	1E	8C	0A	D0	8A	20	E0	2D	10	10	3E	96	00
00D0	A0	5A	00	00	00	18	02	3A	80	18	71	38	2D	40	58	2C
00E0	45	00	A0	5A	00	00	00	1E	01	1D	80	D0	72	1C	16	20
00F0	10	2C	25	80	A0	5A	00	00	00	9E	00	00	00	00	00	55

### - Model List

HD(CCFL)	FHD(CCFL)	HD(LED)	FHD Small(LED)	FHD(LED)
32LK330-SB	32LK450-SA	19LV2500-SA		32LV4500-SA
	37LK450-SA	22LV2500-SA		42LV4500-SA
	42LK450-SA	26LV2500-SA		32LV3500-SA
	47LK450-SA	32LV2500-SA		37LV3500-SA
	32LK430-SA			42LV3500-SA
				47LV3500-SA
				55LV3500-SA

### 4.5. Outgoing condition Configuration

- When pressing IN-STOP key by SVC remocon, Red LED are blinked alternatively. And then Automatically turn off.  
(Must not AC power OFF during blinking)

### 4) HD HDMI EDID data

HDMI 1 (Check sum:B4, 65)

Addr	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
0000	00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
0010	01	15	01	03	80	10	09	78	0A	EE	91	A3	54	4C	99	26
0020	0F	50	54	A1	08	00	81	C0	61	40	45	40	31	40	01	01
0030	01	01	01	01	01	1B	21	50	A0	51	00	1E	30	48	88	
0040	35	00	A0	5A	00	00	00	1C	01	1D	00	72	51	D0	1E	20
0050	6E	28	55	00	A0	5A	00	00	00	1E	00	00	00	FD	00	3A
0060	3E	1F	46	10	00	0A	20	20	20	20	20	20	20	00	00	FC
0070	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	B4
0080	02	03	20	F1	4E	10	1F	84	13	05	14	03	02	12	20	21
0090	22	15	01	26	15	07	50	09	57	07	65	03	0C	00	20	00
00A0	01	1D	80	18	71	1C	16	20	58	2C	25	00	A0	5A	00	00
00B0	00	9E	01	1D	00	80	51	D0	0C	20	40	80	35	00	A0	5A
00C0	00	00	00	1E	8C	0A	D0	8A	20	E0	2D	10	10	3E	96	00
00D0	A0	5A	00	00	00	18	02	3A	80	18	71	38	2D	40	58	2C
00E0	45	00	A0	5A	00	00	00	1E	01	1D	80	D0	72	1C	16	20
00F0	10	2C	25	80	A0	5A	00	00	00	9E	00	00	00	00	00	55

HDMI 2 (Check sum:B4, 55)

Addr	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
0000	00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
0010	01	15	01	03	80	10	09	78	0A	EE	91	A3	54	4C	99	26
0020	0F	50	54	A1	08	00	81	C0	61	40	45	40	31	40	01	01
0030	01	01	01	01	01	1B	21	50	A0	51	00	1E	30	48	88	
0040	35	00	A0	5A	00	00	00	1C	01	1D	00	72	51	D0	1E	20
0050	6E	28	55	00	A0	5A	00	00	00	1E	00	00	00	FD	00	3A
0060	3E	1F	46	10	00	0A	20	20	20	20	20	20	20	00	00	FC
0070	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	B4
0080	02	03	20	F1	4E	10	1F	84	13	05	14	03	02	12	20	21
0090	22	15	01	26	15	07	50	09	57	07	65	03	0C	00	30	00
00A0	01	1D	80	18	71	1C	16	20	58	2C	25	00	A0	5A	00	00
00B0	00	9E	01	1D	00	80	51	D0	0C	20	40	80	35	00	A0	5A
00C0	00	00	00	1E	8C	0A	D0	8A	20	E0	2D	10	10	3E	96	00
00D0	A0	5A	00	00	00	18	02	3A	80	18	71	38	2D	40	58	2C
00E0	45	00	A0	5A	00	00	00	1E	01	1D	80	D0	72	1C	16	20
00F0	10	2C	25	80	A0	5A	00	00	00	9E	00	00	00	00	00	55

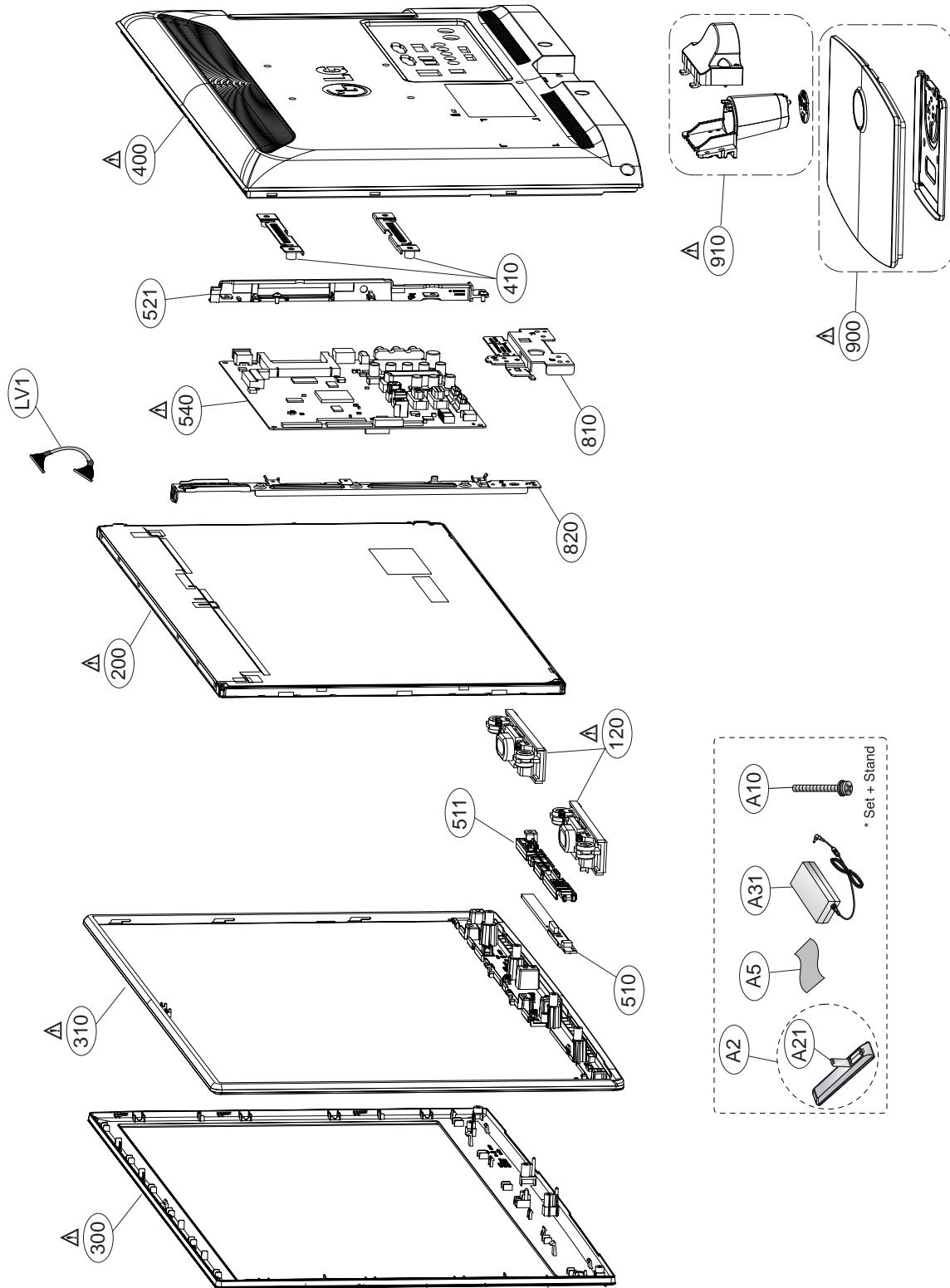
HDMI 3 (Check sum:B4, 45)

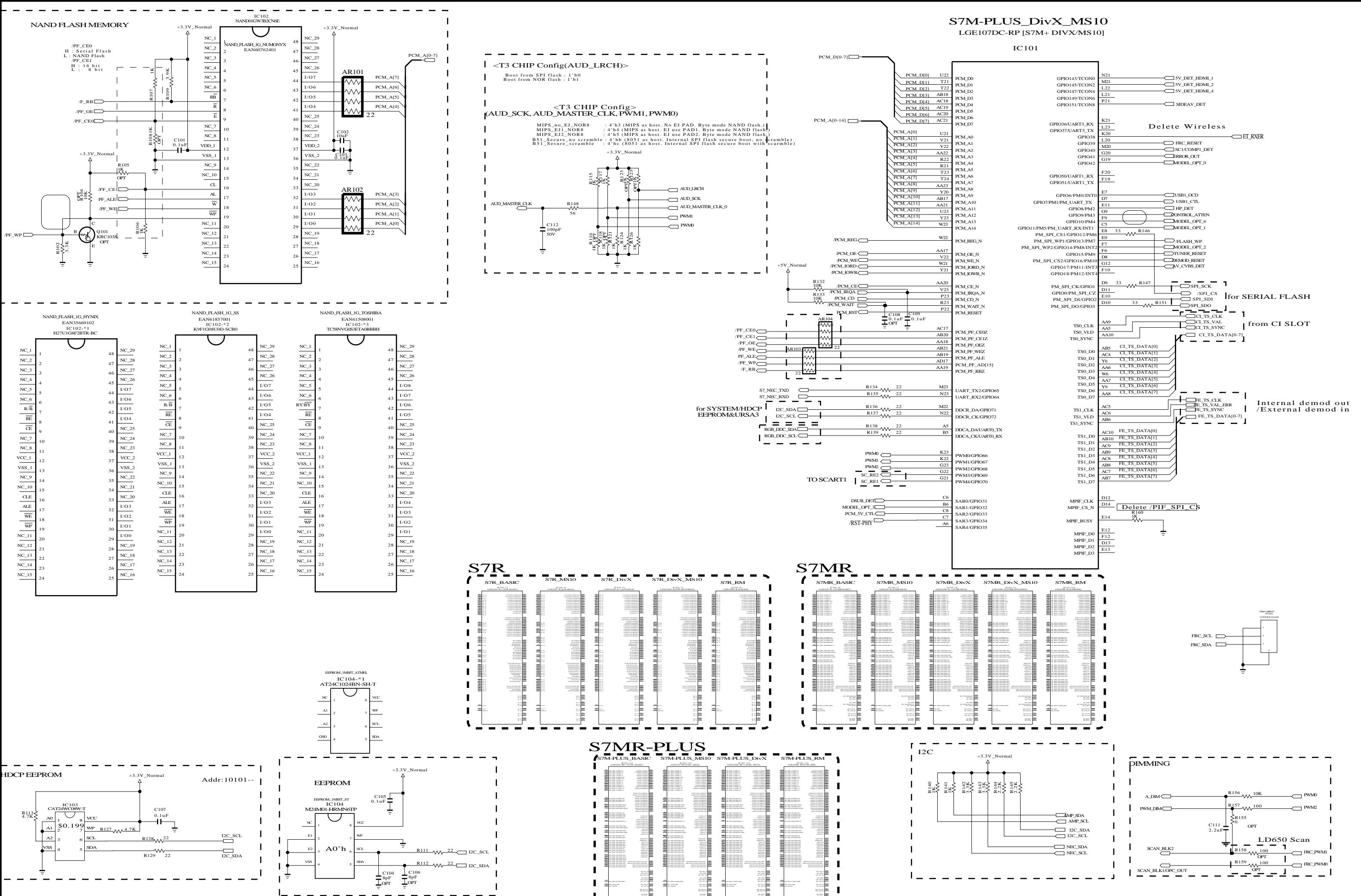
Addr	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
0000	00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
0010	01	15	01	03	80	10	09	78	0A	EE	91	A3	54	4C	99	26
0020	0F	50	54	A1	08	00	81	C0	61	40	45	40	31	40	01	01
0030	01	01	01	01	01	1B	21	50	A0	51	00	1E	30	48	88	
0040	35	00	A0	5A	00	00	00	1C	01	1D	00	72	51	D0	1E	20
0050	6E	28	55	00	A0	5A	00	00	00	1E	00	00	00	FD	00	3A
0060	3E	1F	46	10	00	0A	20	20	20	20	20	20	20	00	00	FC
0070	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	B4
0080	02	03	20	F1	4E	10	1F	84	13	05	14	03	02	12	20	21
0090	22	15	01	26	15	07	50	09	57	07	65	03	0C	00	30	00
00A0	01	1D	80	18	71	1C	16	20	58	2C	25	00	A0	5A	00	00
00B0	00	9E	01	1D	00	80	51	D0	0C	20	40	80	35	00	A0	5A
00C0	00	00	00	1E	8C	0A	D0	8A	20	E0	2D	10	10	3E	96	00
00D0	A0	5A	00	00	00	18	02	3A	80	18	71	38	2D	40	58	2C
00E0	45	00	A0	5A	00	00	00	1E	01	1D	80	D0	72	1C	16	20
00F0	10	2C	25	80	A0	5A	00	00	00	9E	00	00	00	00	00	45

# EXPLODED VIEW

## IMPORTANT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by  $\Delta$  in the Schematic Diagram and EXPLODED VIEW.  
It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent X-RADIATION, Shock, Fire, or other Hazards.  
Do not modify the original design without permission of manufacturer.



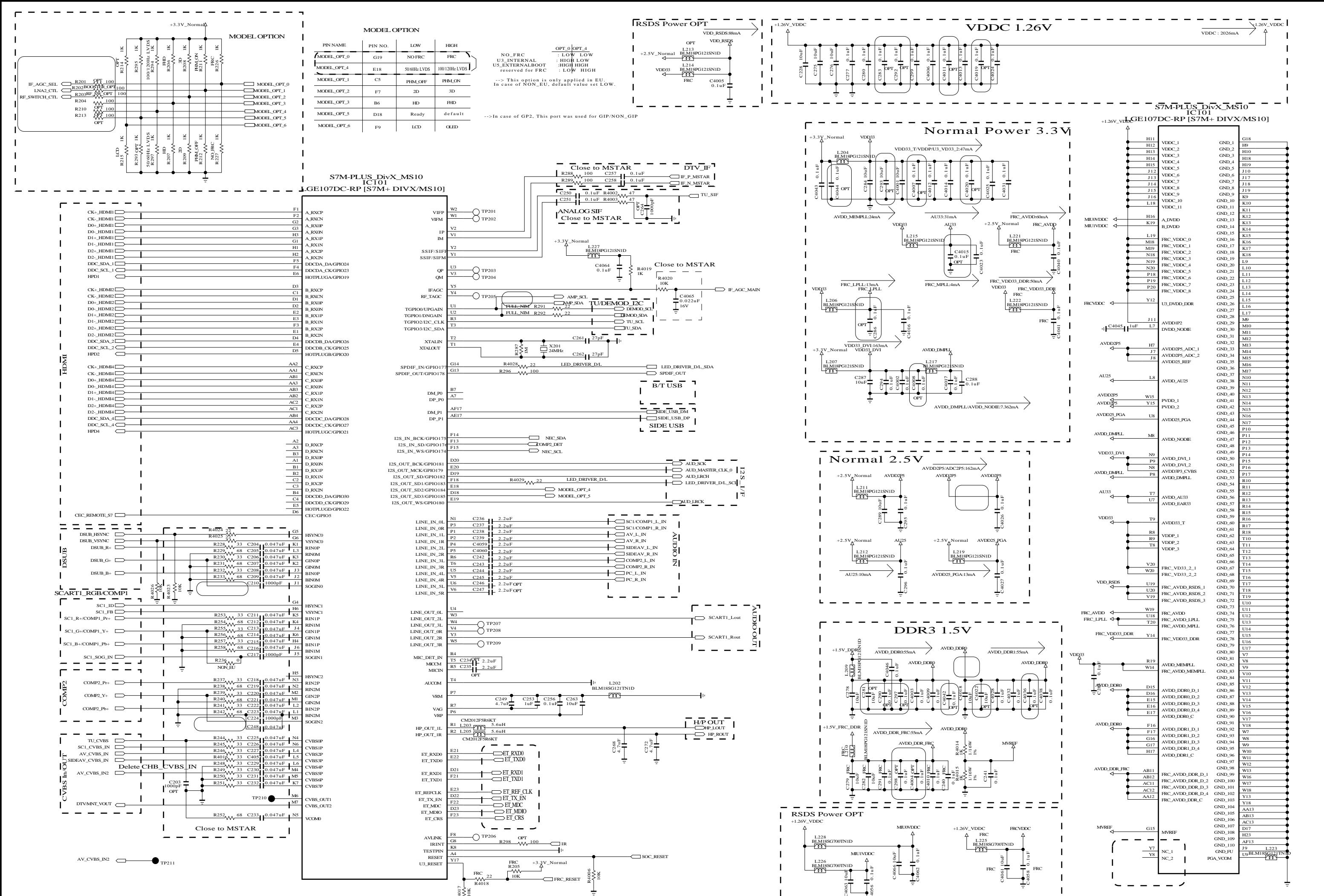


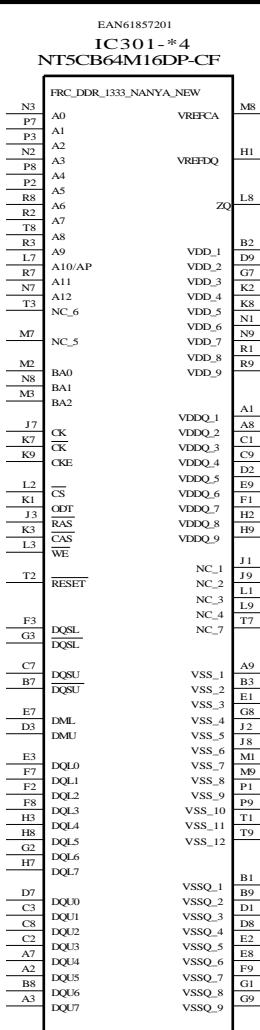
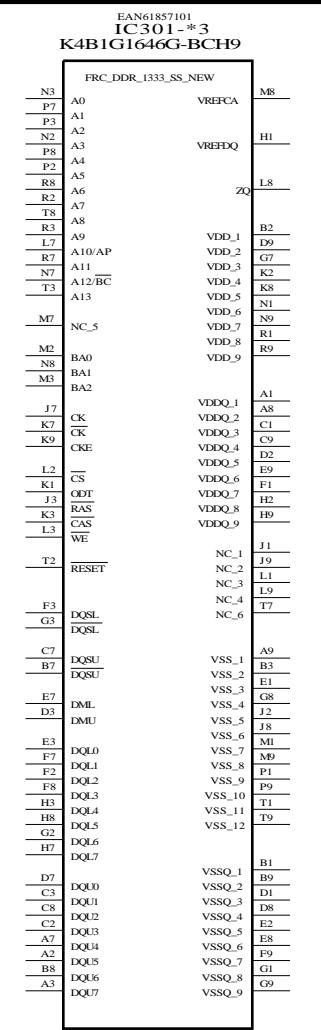
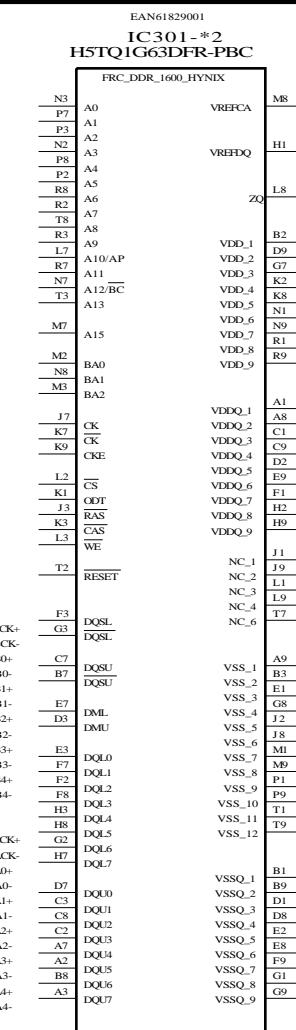
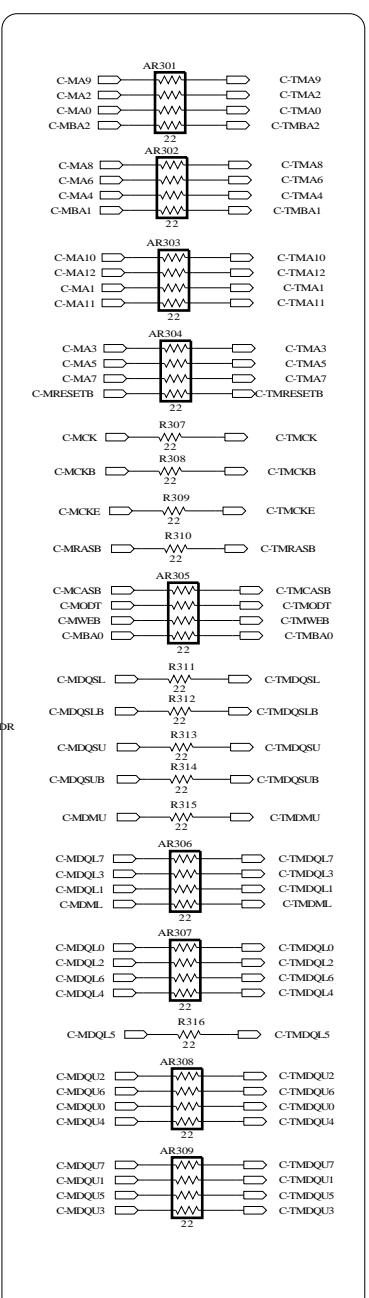
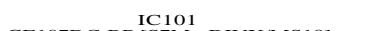
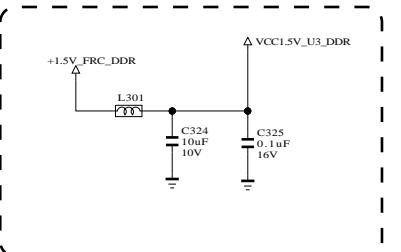
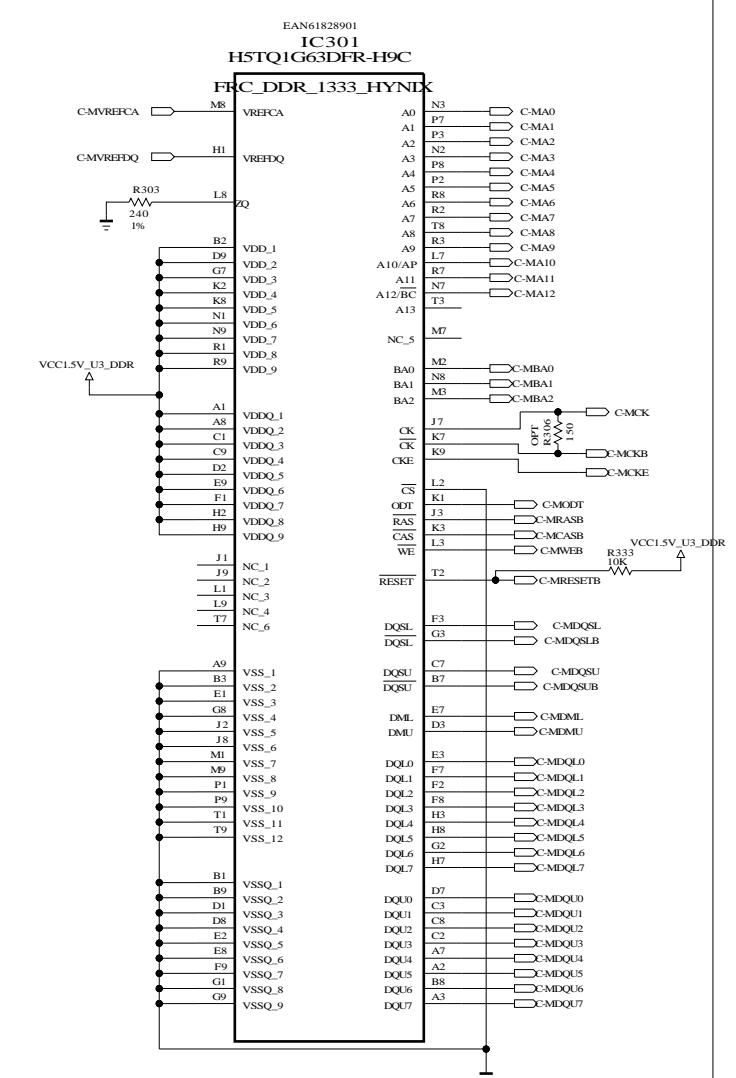
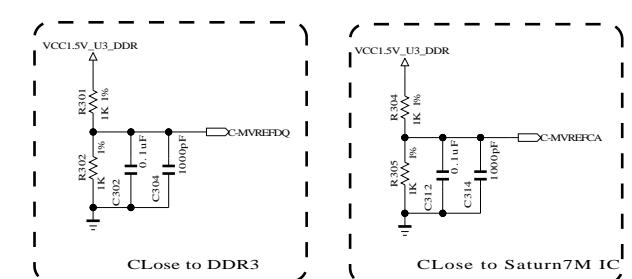
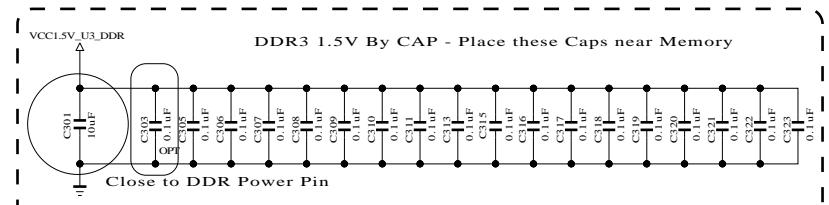
THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILTER AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.

**SECRET**  
LG Electronics

LG ELECTRONICS

MODEL BLOCK	GP3_Saturn7M	DATE SHEET	Ver. O.1
	FLASH/EEPROM/GPIO		1





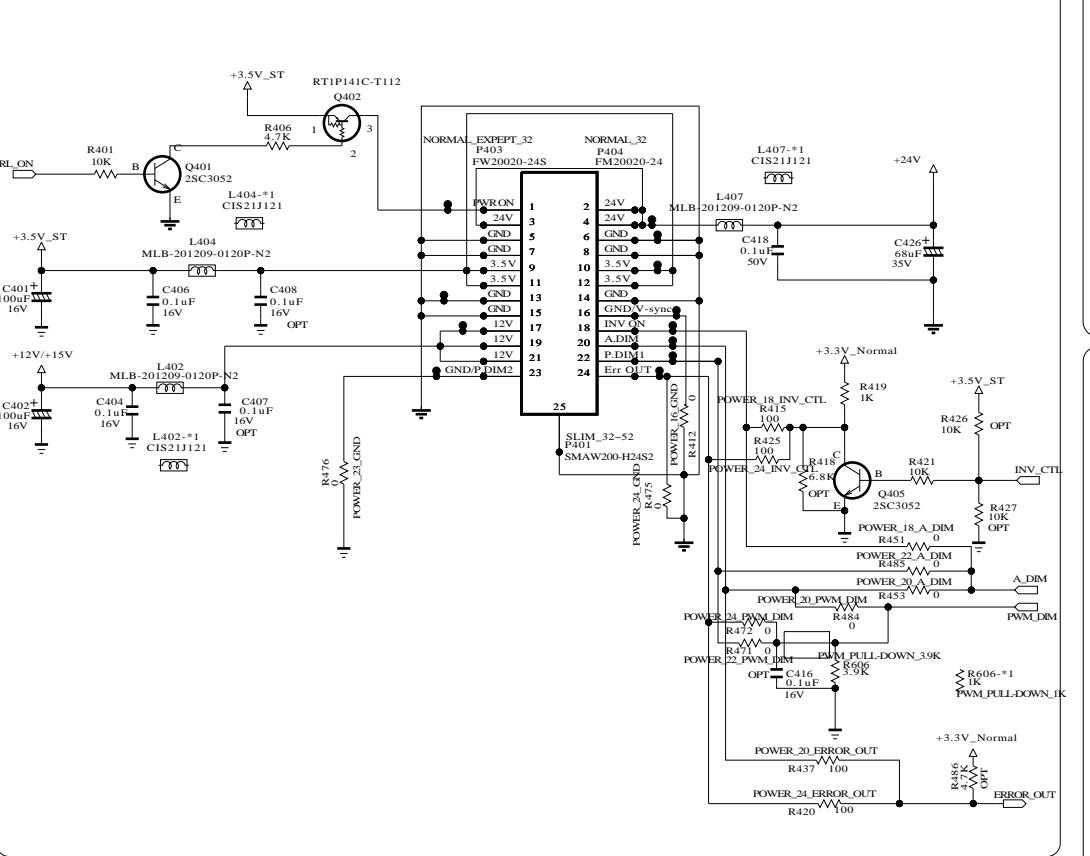
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SECRET



MODEL	GP2R	DATE	20101023
WORK	FRC_DDR	SHEET	3 /

# FROM LIPS & POWER B/D



<MODULE PIN MAP>

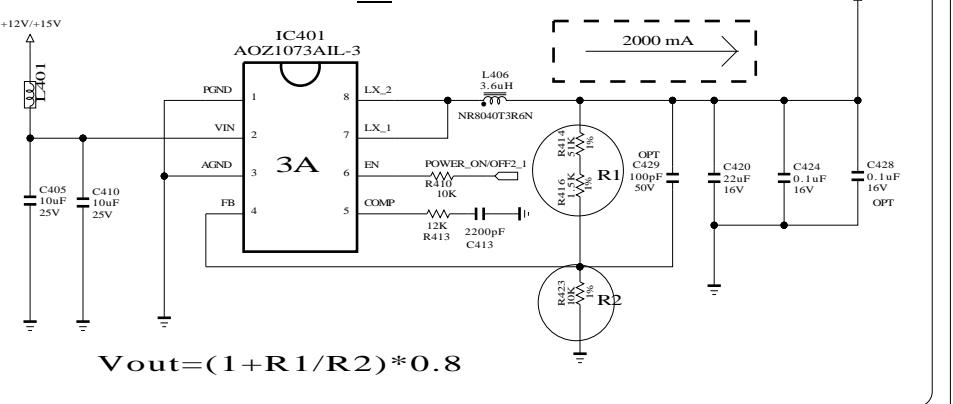
PIN No	LGD(PSU) or LIPS (PSU)	CMO10Lamp (PSU)	AUO 10Lamp (PSU)	SHARP (PSU)	IPS-@ (PSU)
16	GND	GND	GND	GND	GND
18	INV_ON	A-DIM	INV_ON	INV_ON	INV_ON
20	VBR-A	NC	Err_out	S2/60:ERROR 2/32HD:NC	Err_out
22	PWM_DIM	PWM_DIM	NC	2/32/52:PWM 60:NC	NC
24	Err_out	INV_ON	PWM_DIM	2/32/52:GND 60:PWM	PWM_DIM
23	GND	GND	GND	GND	GND

<LED MODULE PIN MAP -> latest update 20100618>

PIN No	LGD LPB / 32LE5300-TA CM010LED (PSU)	32LE4500-TA AUO 10LED (PSU)	32LE300-TA LGD 10LED (PSU)
16	NC	NC	NC
18	INV_ON	INV_ON	INV_ON
20	NC	err_out	err_out
22	PWM_DIM	NC	NC
24	err_out	PWM_DIM	PWM_DIM
23	NC	NC	NC

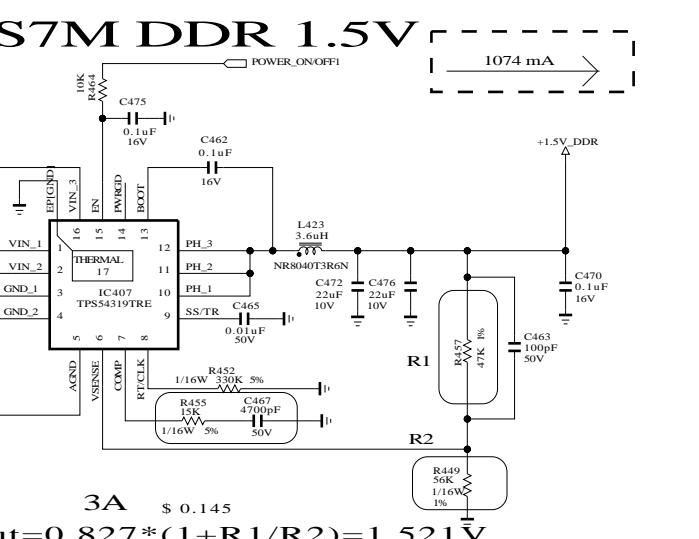
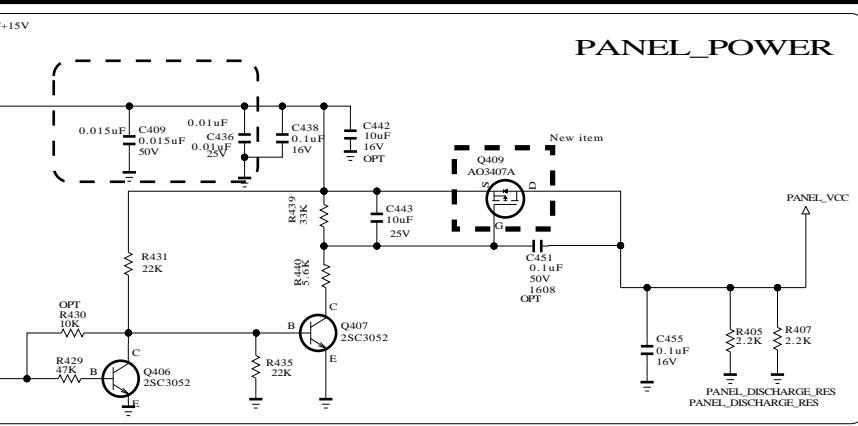
LGD edge led error-out use or not? checking is necessary...

+5V\_USB



$$V_{out} = (1 + R1/R2) * 0.8$$

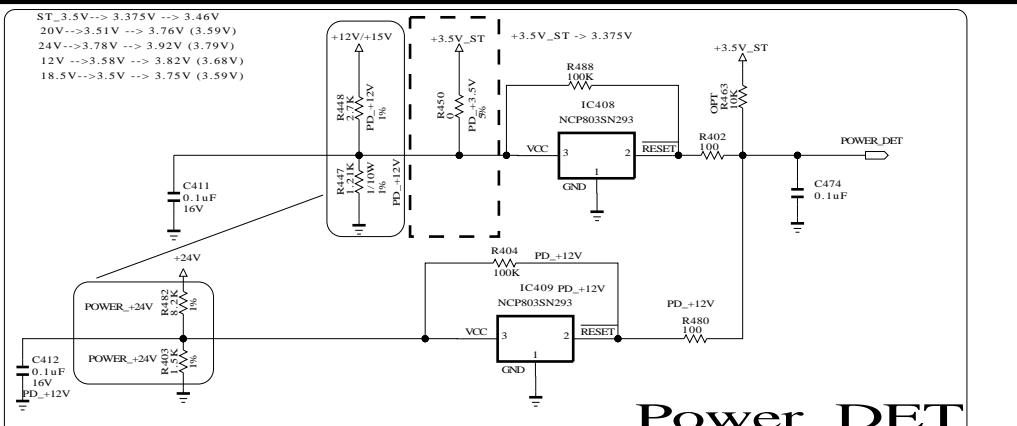
# PANEL\_POWER



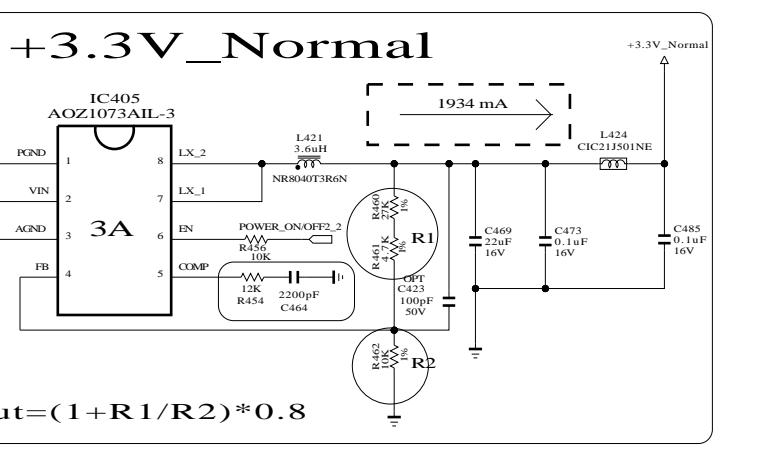
$$V_{out} = 0.827 * (1 + R1/R2) = 1.521 \text{ V}$$

3A \$ 0.145

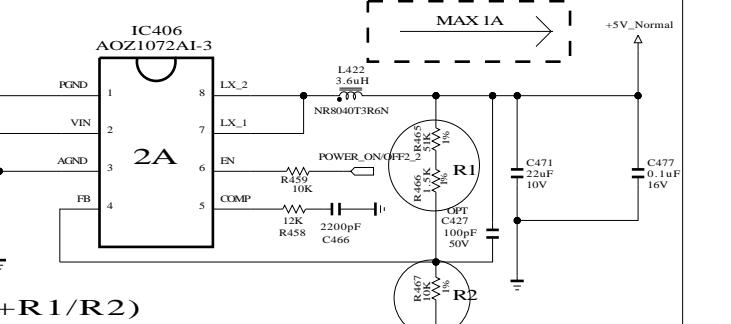
+3.3V\_Normal



Power\_DET

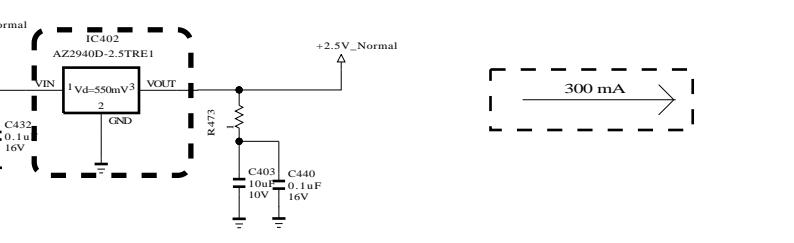


+3.3V\_Normal

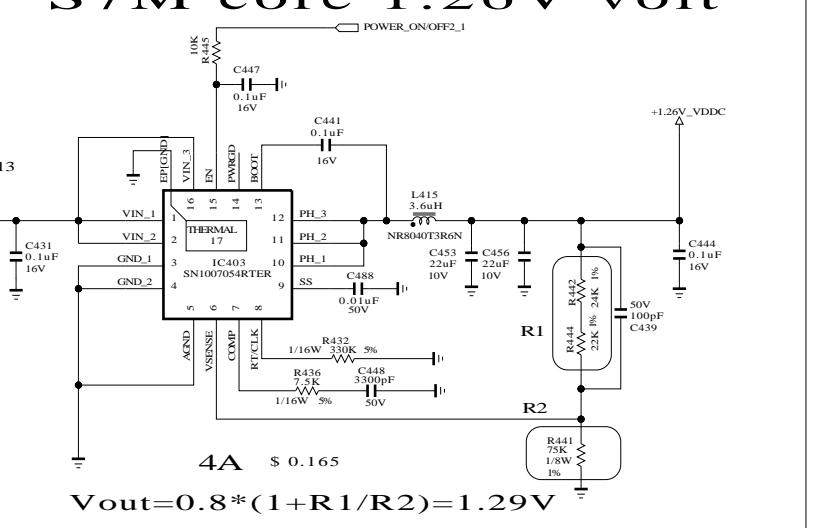


$$V_{out} = 0.8 * (1 + R1/R2)$$

+2.5V/+1.8V

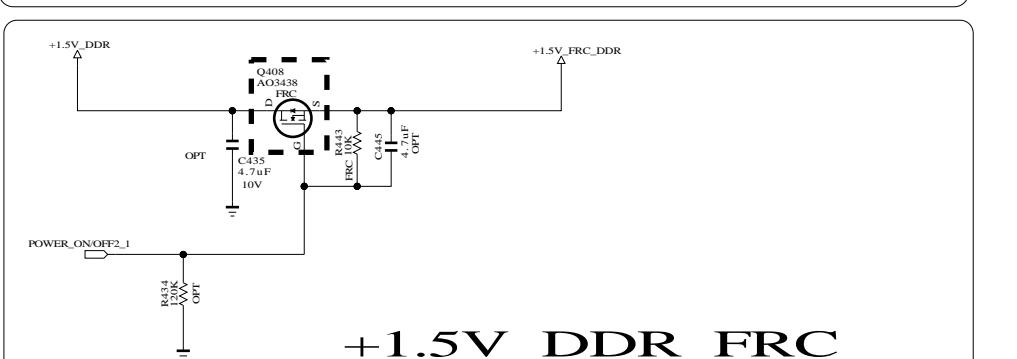


S7M core 1.26V volt



$$V_{out} = 0.8 * (1 + R1/R2) = 1.29 \text{ V}$$

+1.5V\_DDR\_FRC

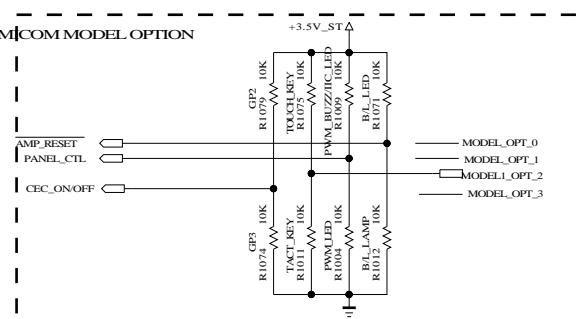
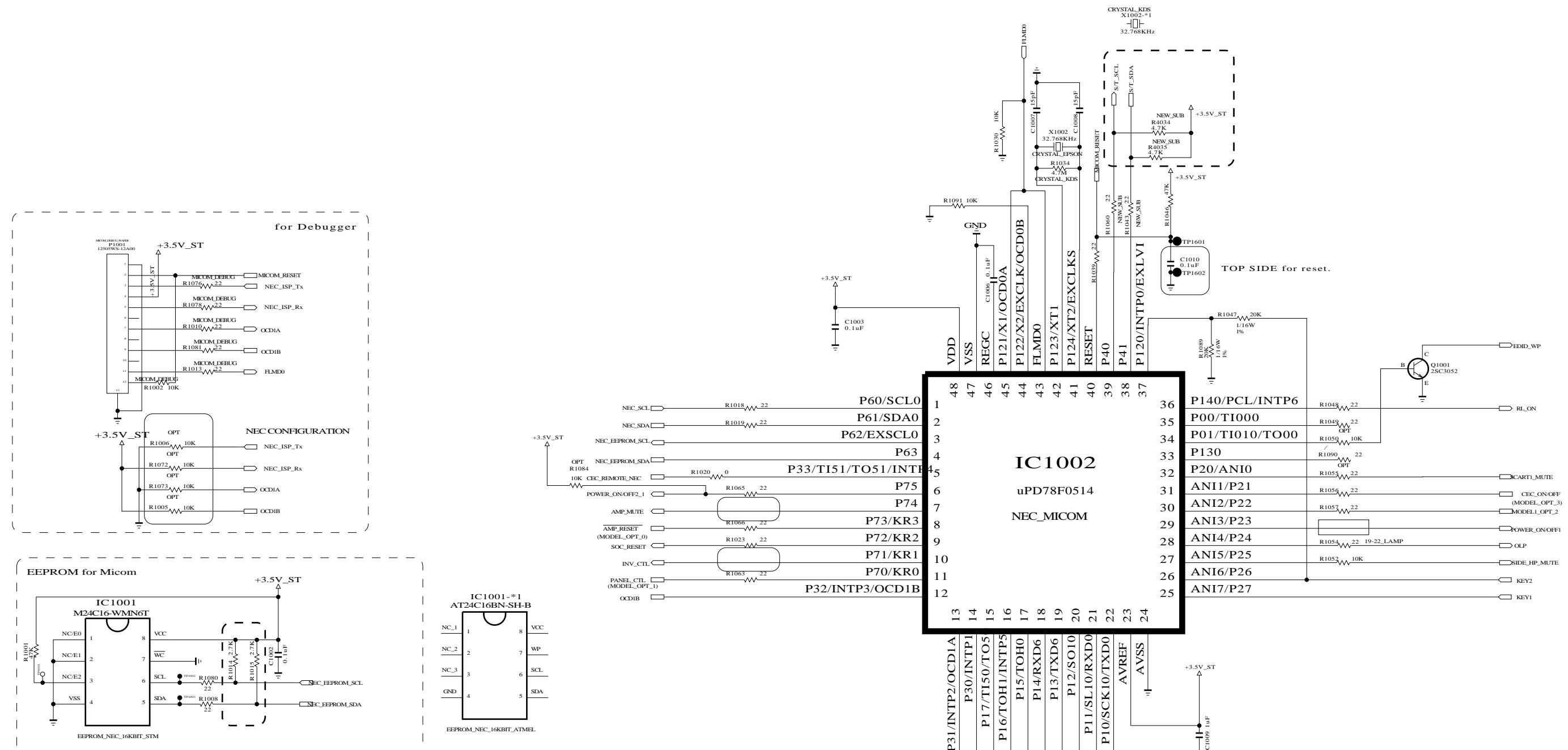


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LG Electronics

LG ELECTRONICS

MODEL BLOCK	GP2R	DATE SHEET	20101023
	POWER_LARGE		4



2011Y,GP2R, 101125 Update				
MODEL OPTION				
PIN NAME	PIN NO.	HIGH	LOW	
MODEL_OPT_0	8	B/L_LED	B/L_LAMP	
MODEL_OPT_1	11	PWM_BUZZ_IIC_LED	PWM_LED	
MODEL_OPT_2	30	TOUCH_KEY	TACT_KEY	
MODEL_OPT_3	31	GP2	GP3	
PWM_BUZZ/IIC_LED : Using IIC for LED Breathing & PWM Buzz PWM_LED : Using PWM Signal for LED Lighting				

PIN NAME	PIN NO.	HIGH	LOW	Description
MODEL_OPT_0	8	LOW	LOW	LK330/LK450 for KR/US 10Y EYE-Q Sensor
MODEL_OPT_1	11	LOW	LOW	KEY & PWM LED & No Buzz & No LED Blink
MODEL_OPT_2	30	HIGH	HIGH	KEY & PWM LED & No Buzz & No LED Blink
MODEL_OPT_3	31	LOW	LOW	LV25/LV35/LV45/LV45/LV55/LK45/LK55 S/T & IIC LED & NO BUZZ & LED Blink
				IIC LED(09Y IIC Protocol) & NO BUZZ
				S/T & IIC LED & No Buzz & LED Blink

2010Y,GP2				
MODEL OPTION				
PIN NAME	PIN NO.	HIGH	LOW	
MODEL_OPT_0	8	LOW	LOW	LOW
MODEL_OPT_1	11	PWM_BUZZ_IIC_LED	PWM_LED	HIGH
MODEL_OPT_2	30	TOUCH_KEY	TACT_KEY	HIGH
MODEL_OPT_3	31	GPIO_LED	NON_GPIO_LED	LOW
PWM_BUZZ/IIC_LED : For model that use LED Lighting used IIC PWM_LED : For model that use LED Lighting used PWM Signal				

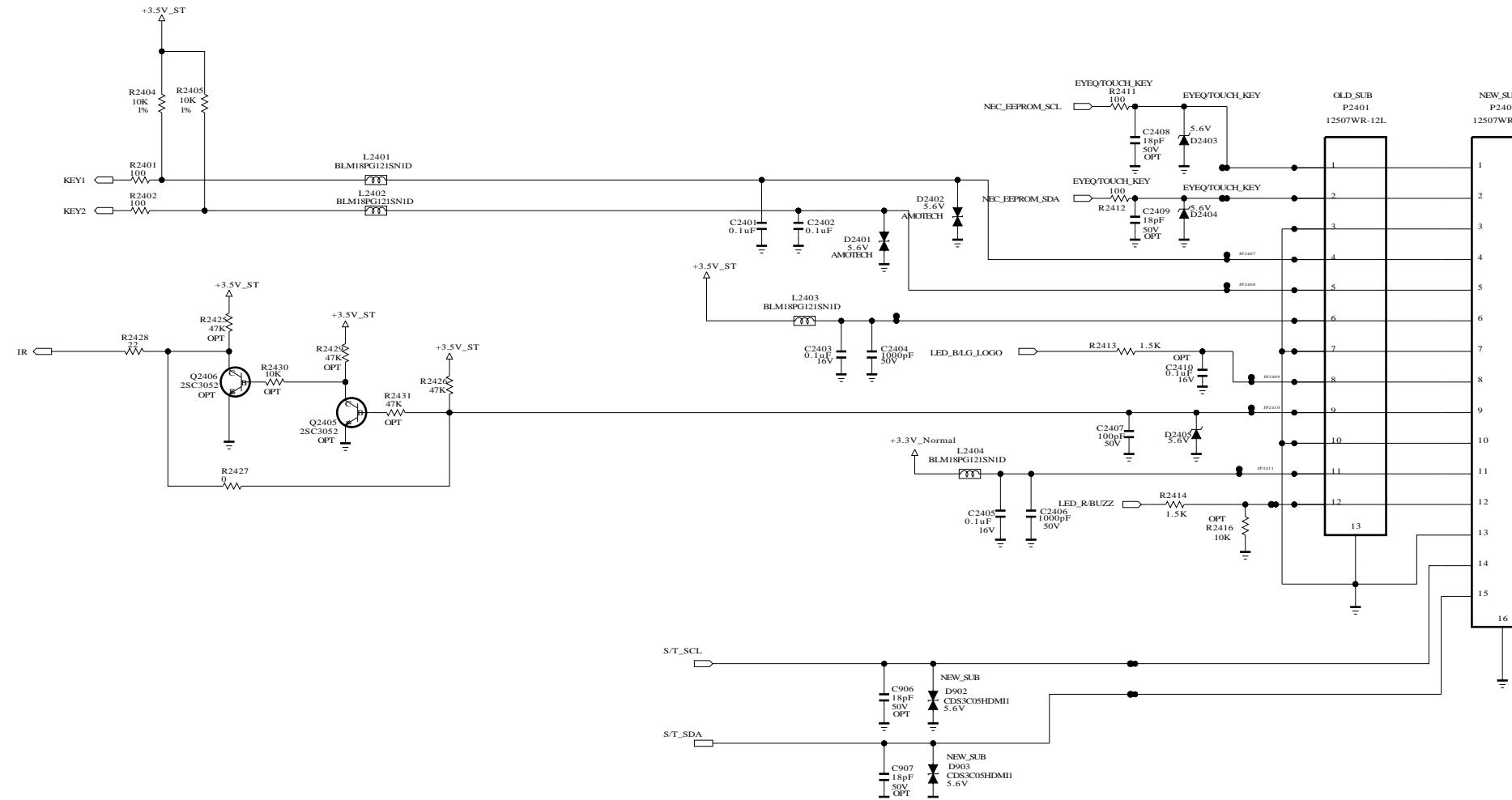
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LG Electronics

LG ELECTRONICS

MODEL BLOCK	GP2R	DATE	20101125
	MICOM Rev.4	SHEET	5

**CONTROL**  
**IR & LED**

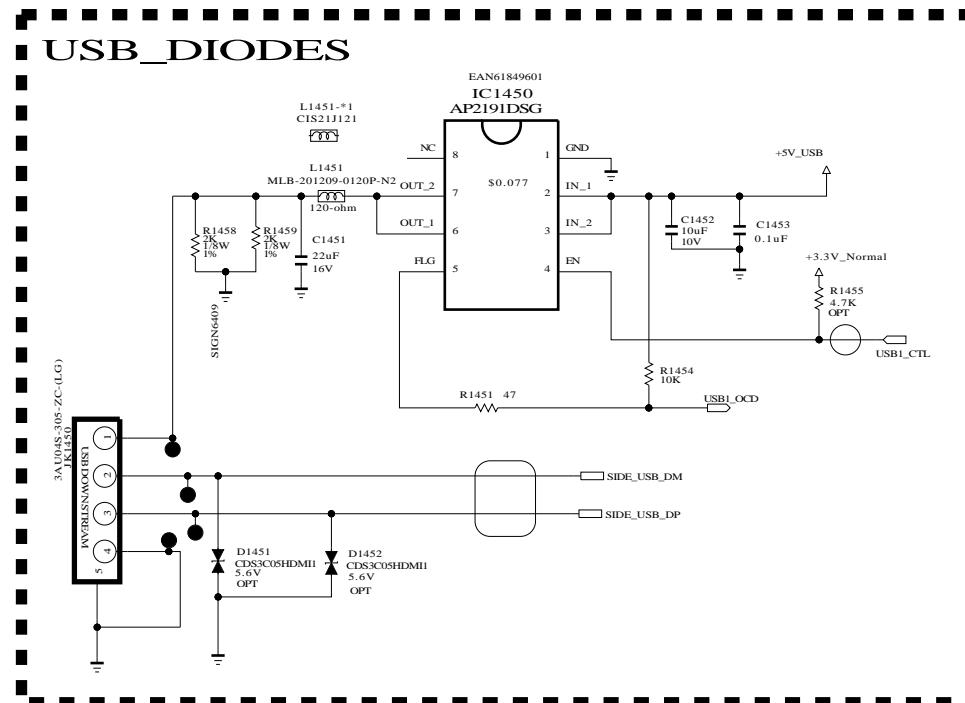


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**SECRET**  
LG Electronics

LG ELECTRONICS

<b>MODEL</b>	GP2R	<b>DATE</b>	20101023
<b>BLOCK</b>	IR/CONTROL-L	<b>SHEET</b>	6 /



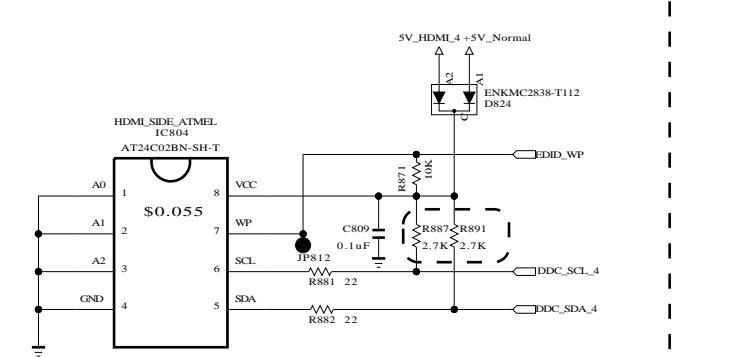
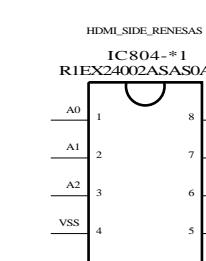
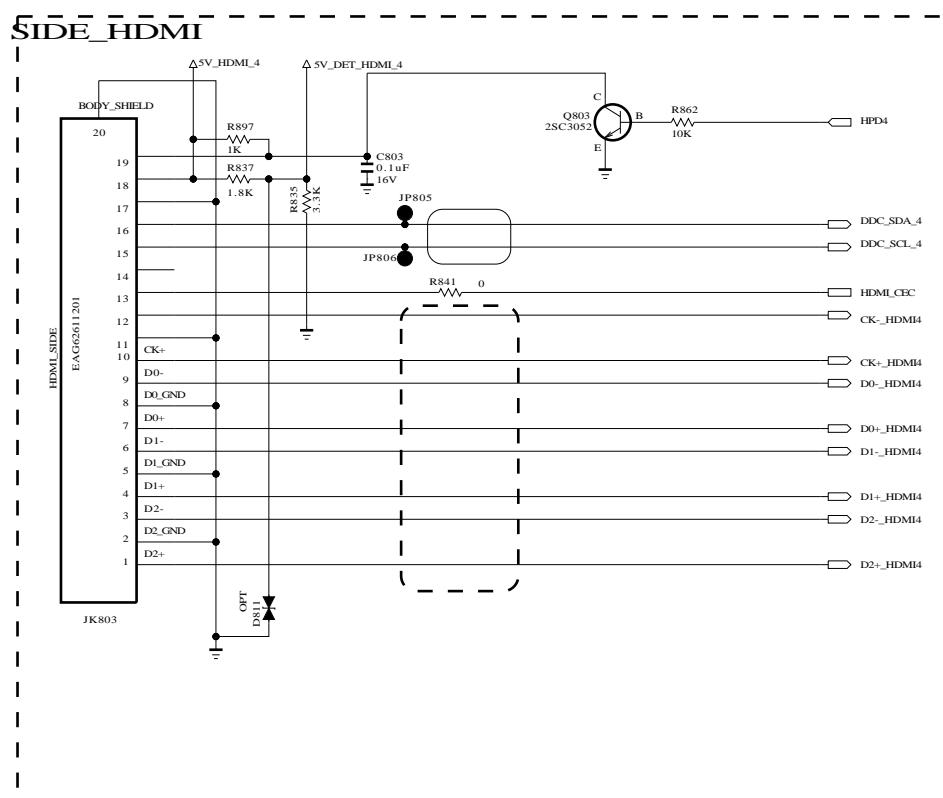
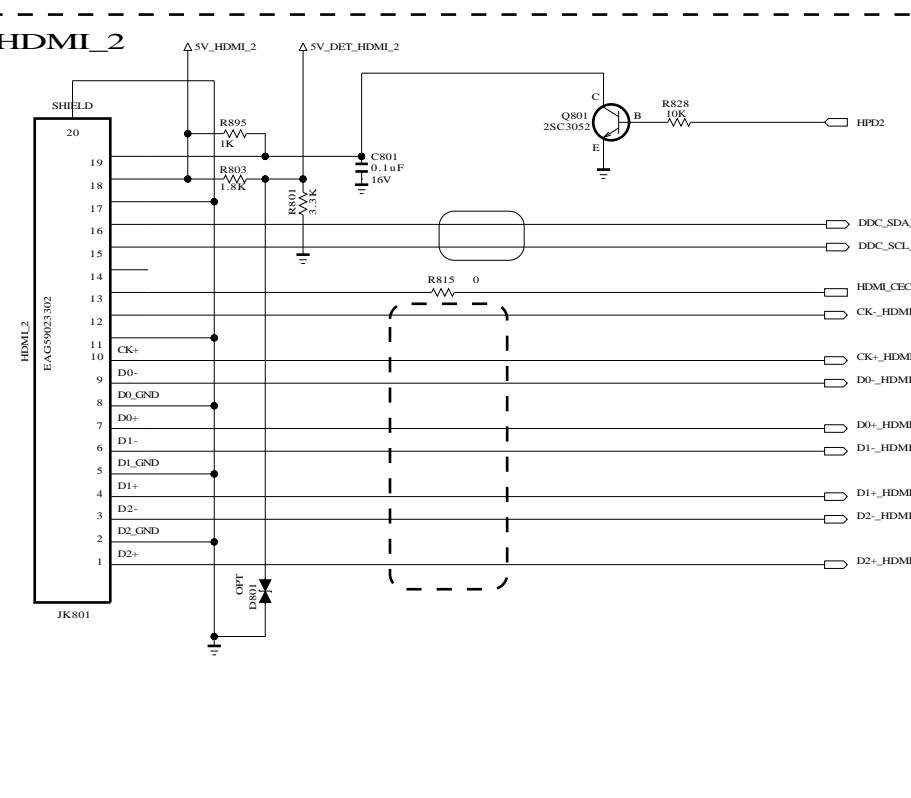
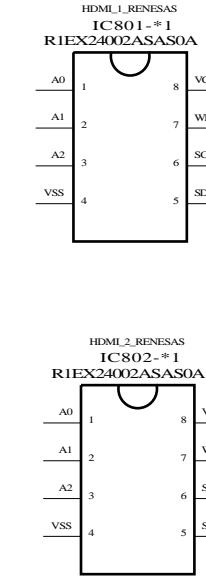
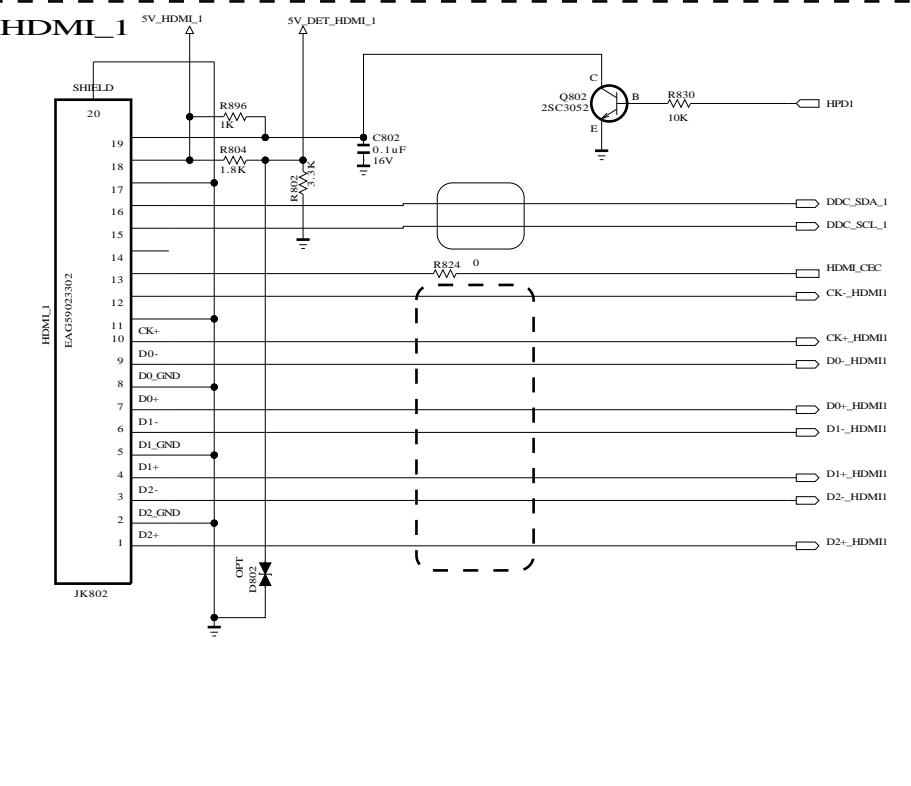
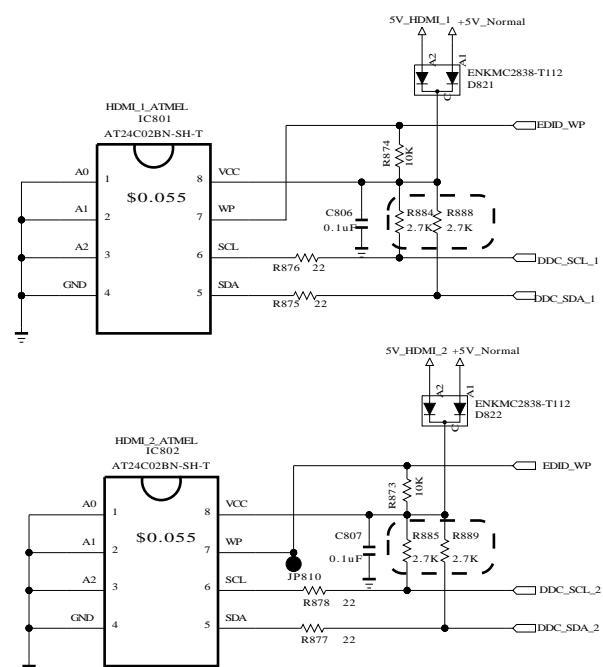
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LG Electronics

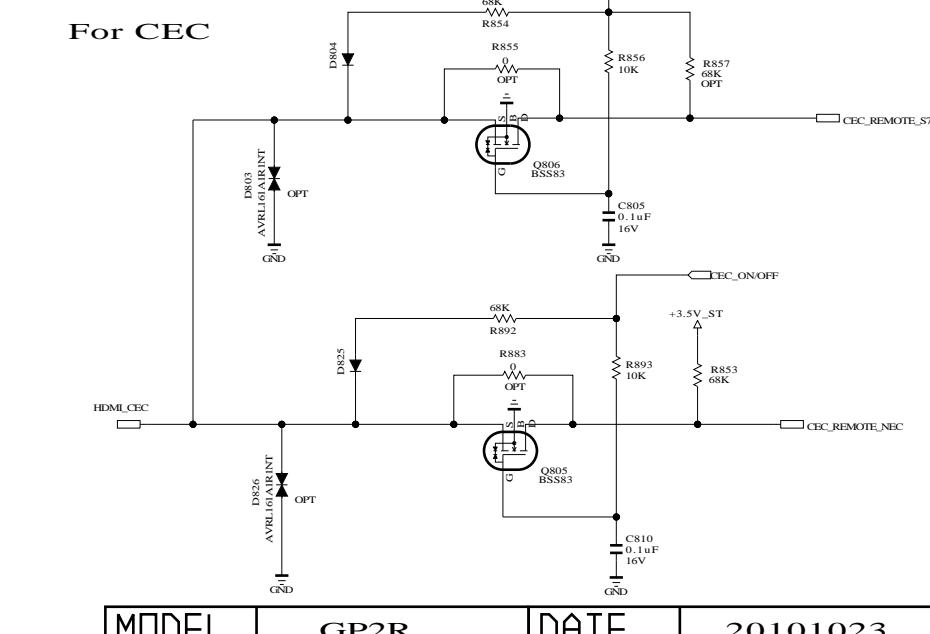
LG ELECTRONICS

MODEL	GP2R	DATE	20101023
BLOCK	USB_OCP_DIODE	SHEET	7

## HDMI EEPROM



## For CEC



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LG Electronics

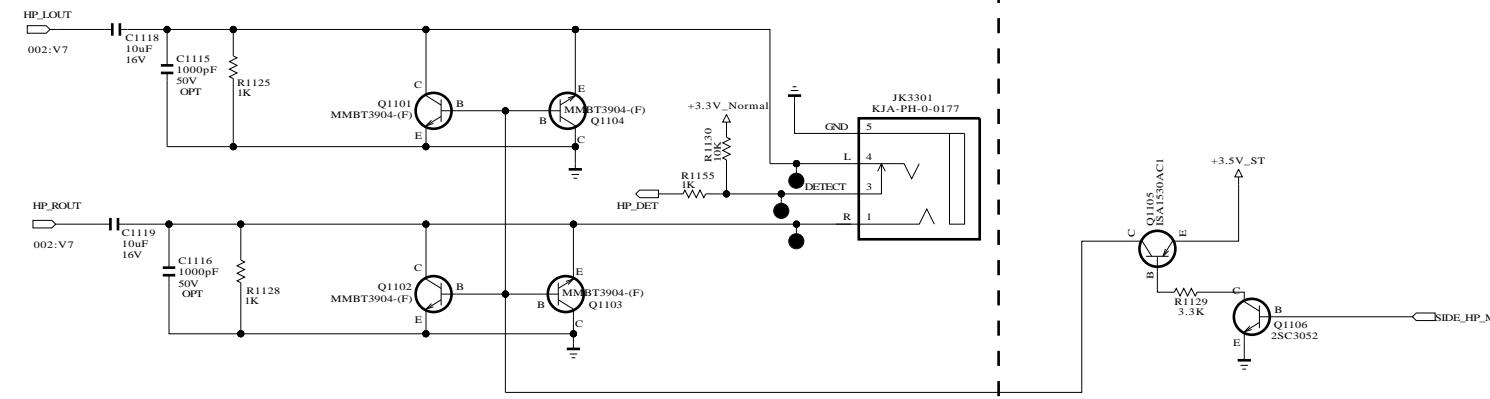
LG ELECTRONICS

<b>MODEL</b>	<b>GP2R</b>	<b>DATE</b>	20101023
<b>BLOCK</b>	<b>HDMI</b>	<b>SHEET</b>	8

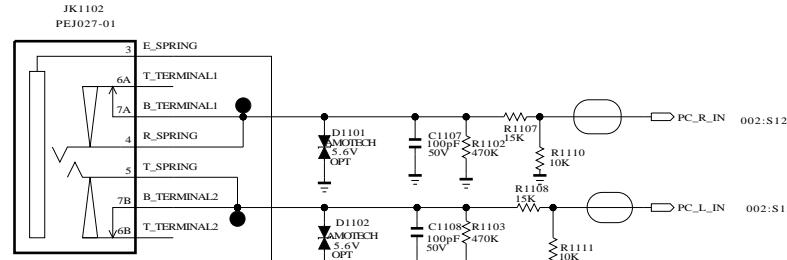
# RGB/SPDIF/PC/HP

## New Item Development

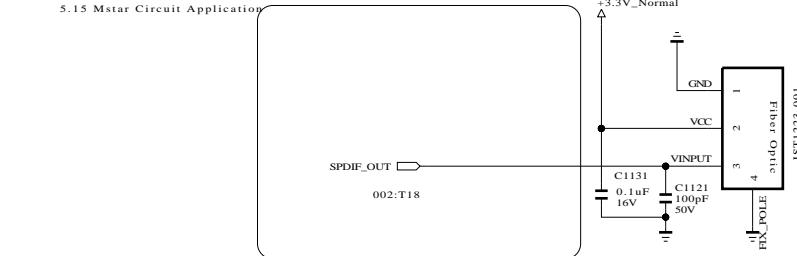
### EARPHONE BLOCK



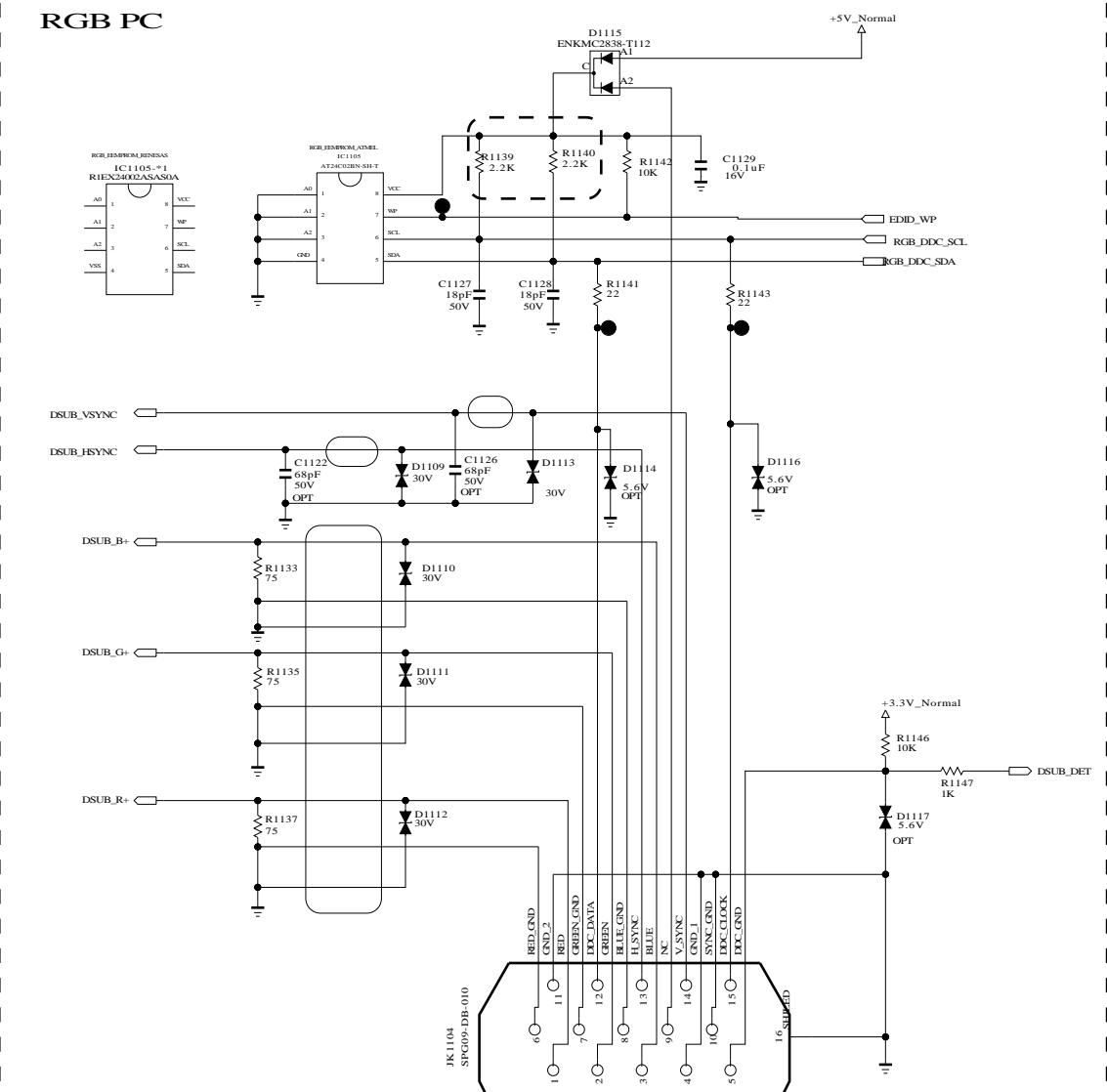
### PC AUDIO



### SPDIF OPTIC JACK



### RGB PC

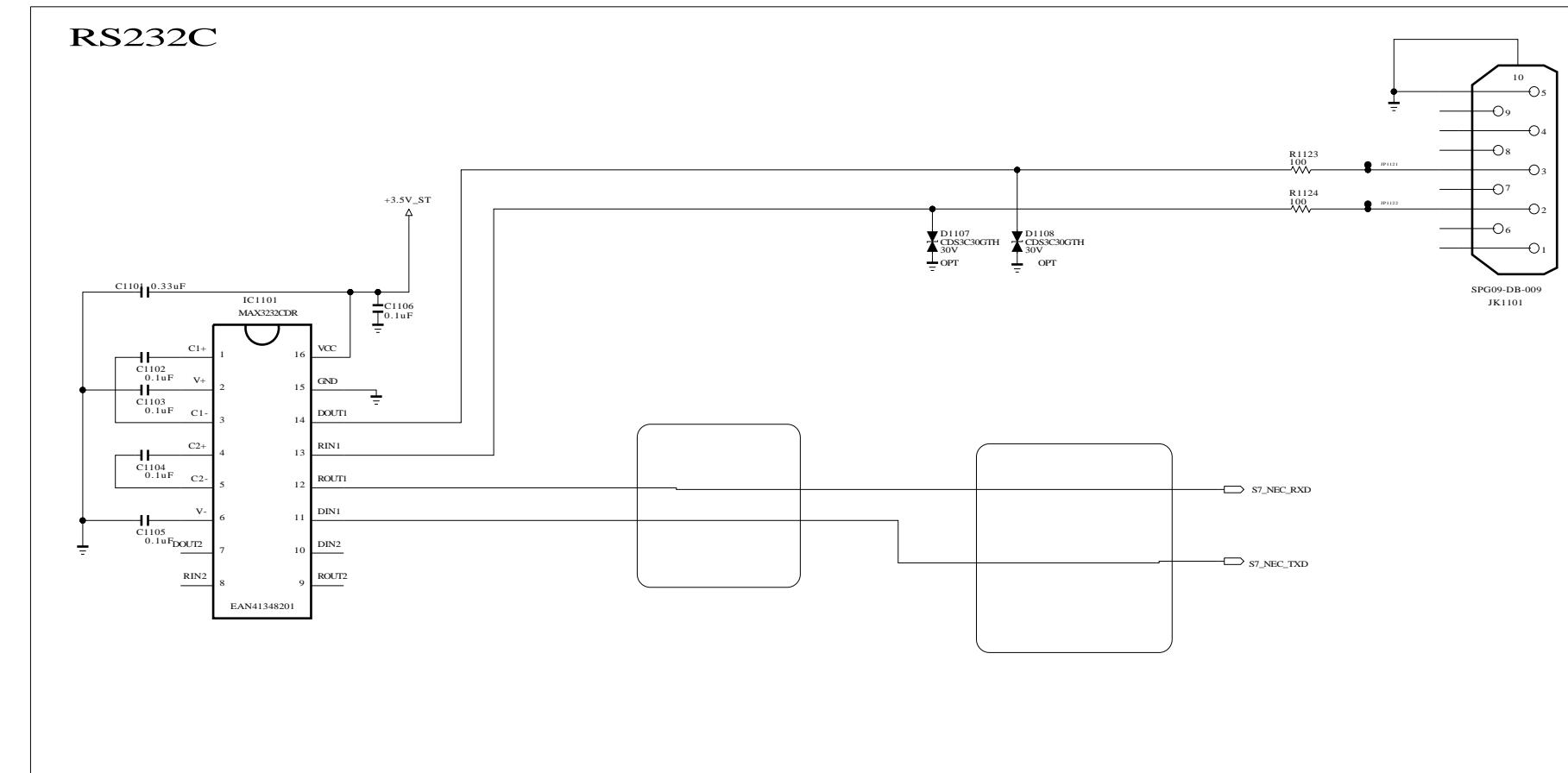


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LG Electronics

LG ELECTRONICS

MODEL	GP2R	DATE	20101023
BLOCK	RGB/SPDIF/HP	SHEET	9



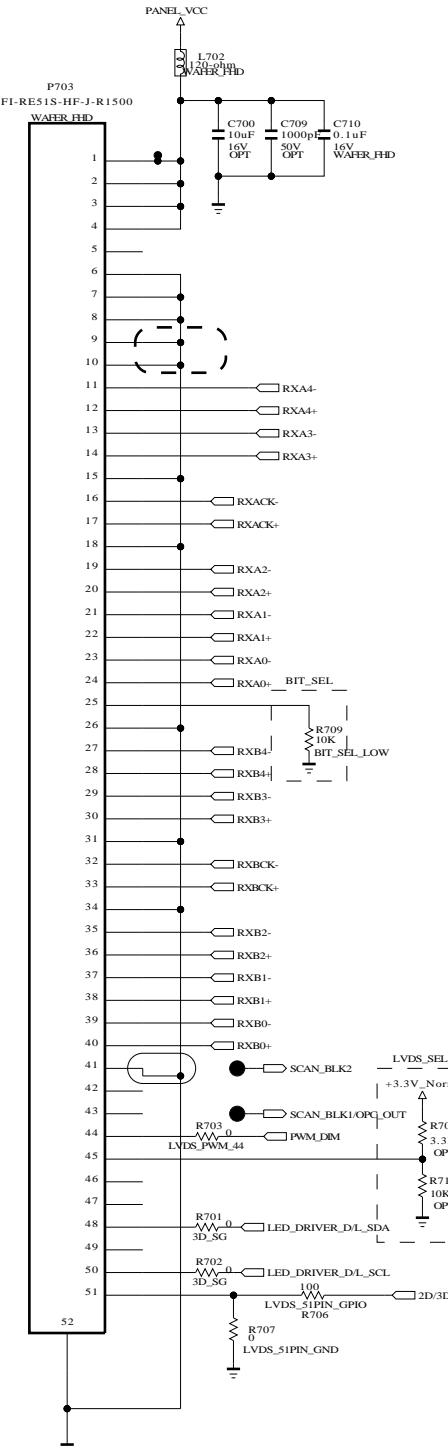
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SECRET  
LG Electronics

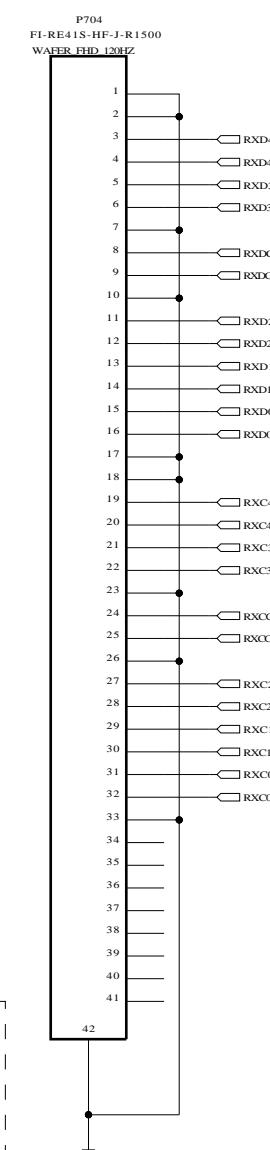
LG ELECTRONICS

MODEL BLOCK	GP2R RS232C_9PIN	DATE SHEET	20101023 10
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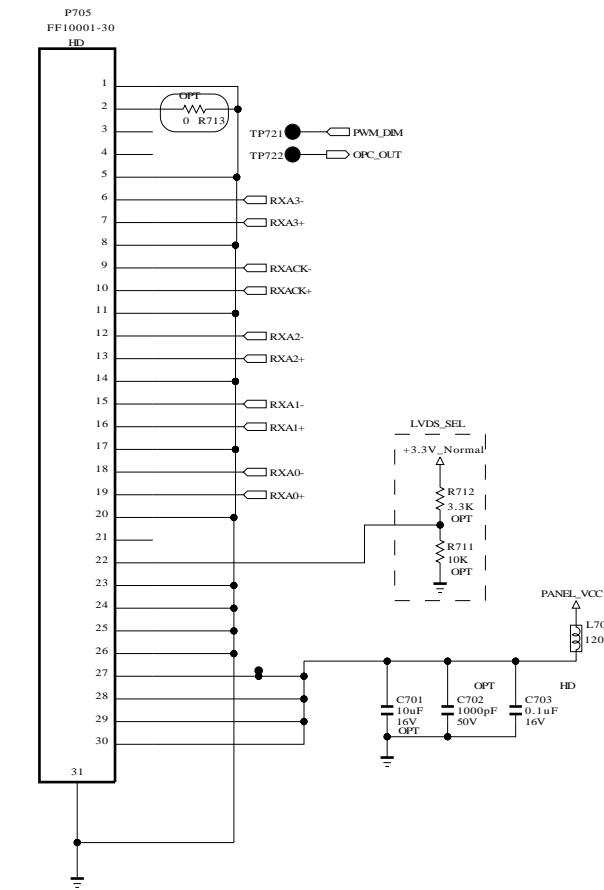
[51Pin LVDS Connector]  
(For FHD 60/120Hz)



[41Pin LVDS Connector]  
(For FHD 120Hz)



[30Pin LVDS Connector]  
(For HD 60Hz\_Normal)

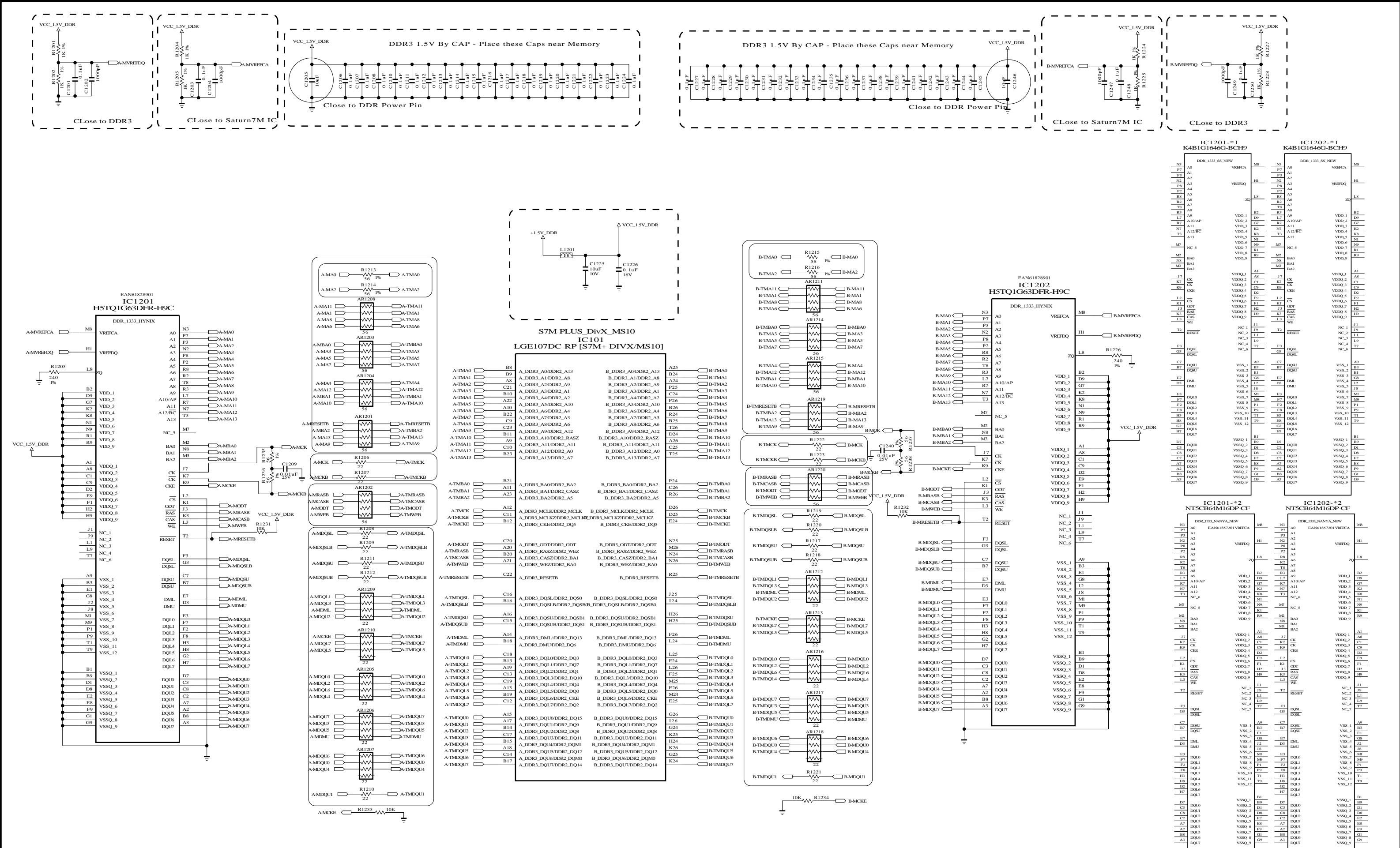


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LG Electronics

LG ELECTRONICS

<b>MODEL</b>	GP2R	<b>DATE</b>	20101023
<b>BLOCK</b>	LVDS_LARGE	<b>SHEET</b>	11 /

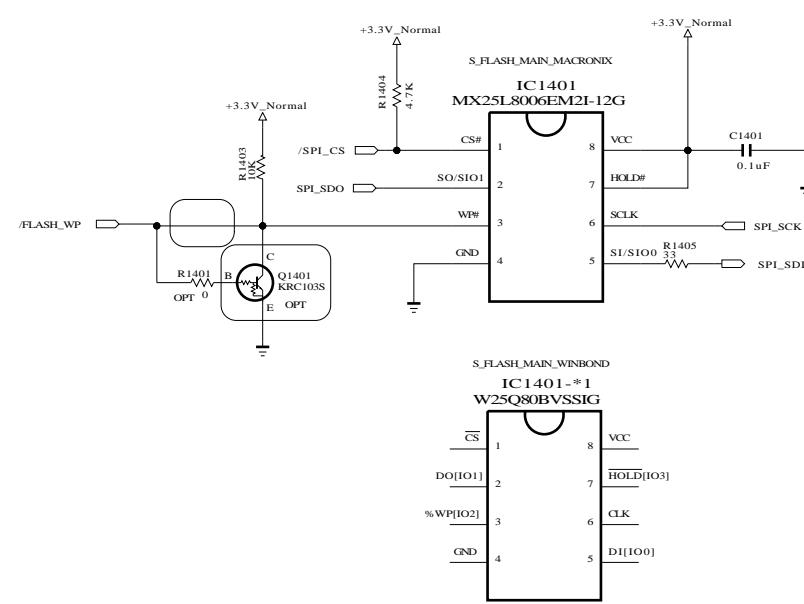


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LG Electronics

LG ELECTRONICS

MODEL	GP2R	DATE	20101023
BLOCK	DDR_256	SHEET	12 /



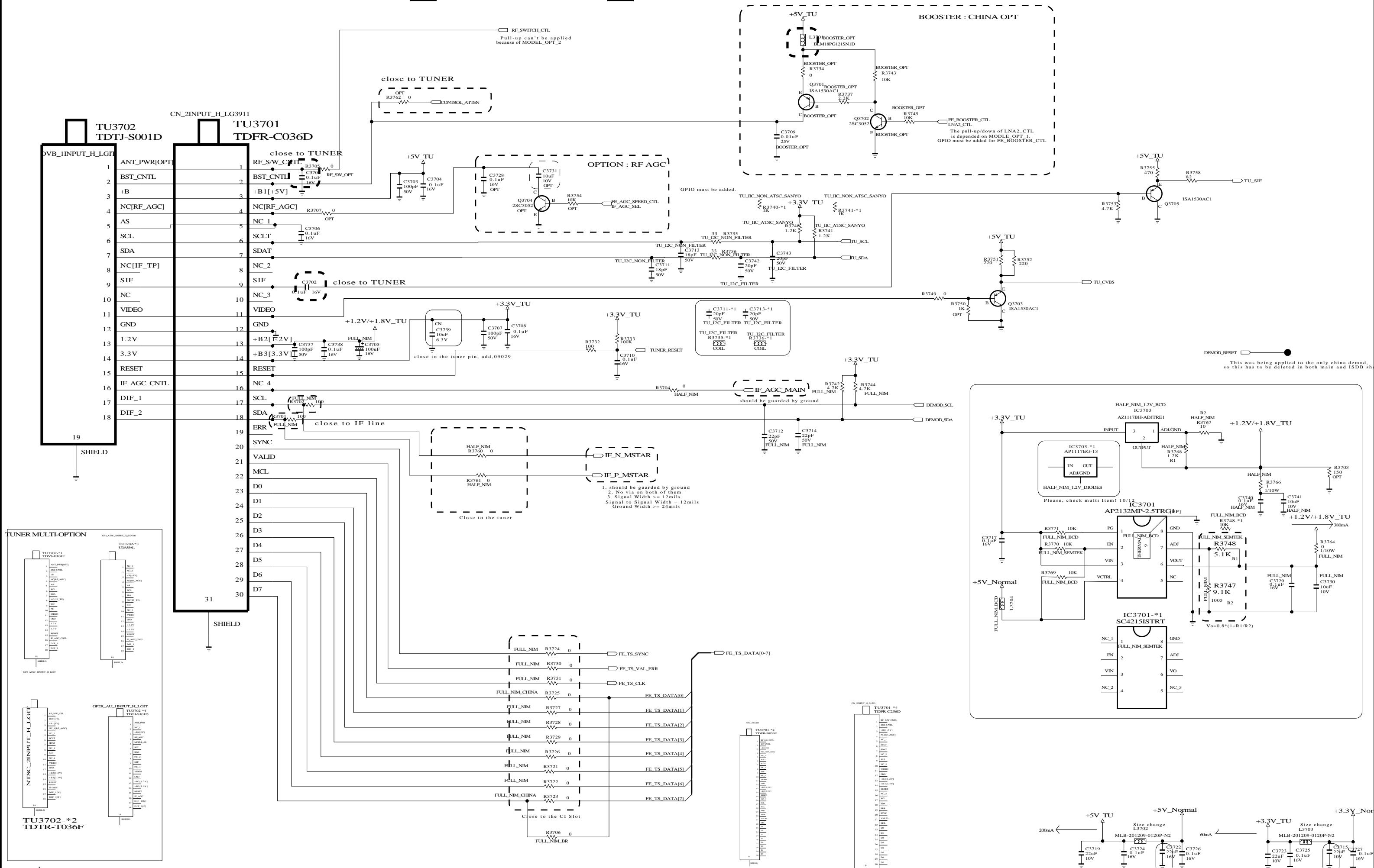
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LG Electronics

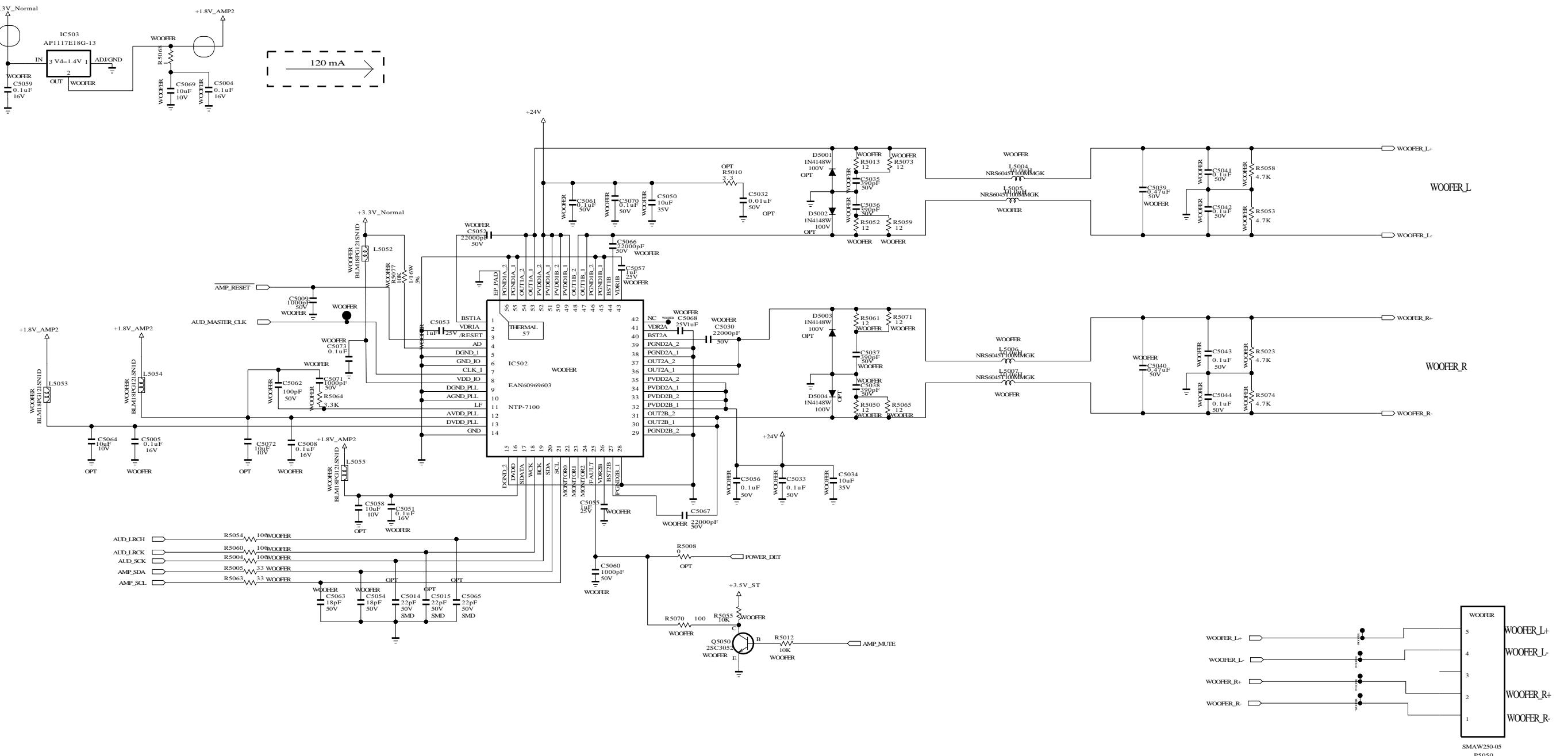
LG ELECTRONICS

MODEL	GP2R	DATE	20101023
BLOCK	FLASH 1MB	SHEET	13 /

# GP2R\_LARGE\_TUNER



# WOOFER AMP

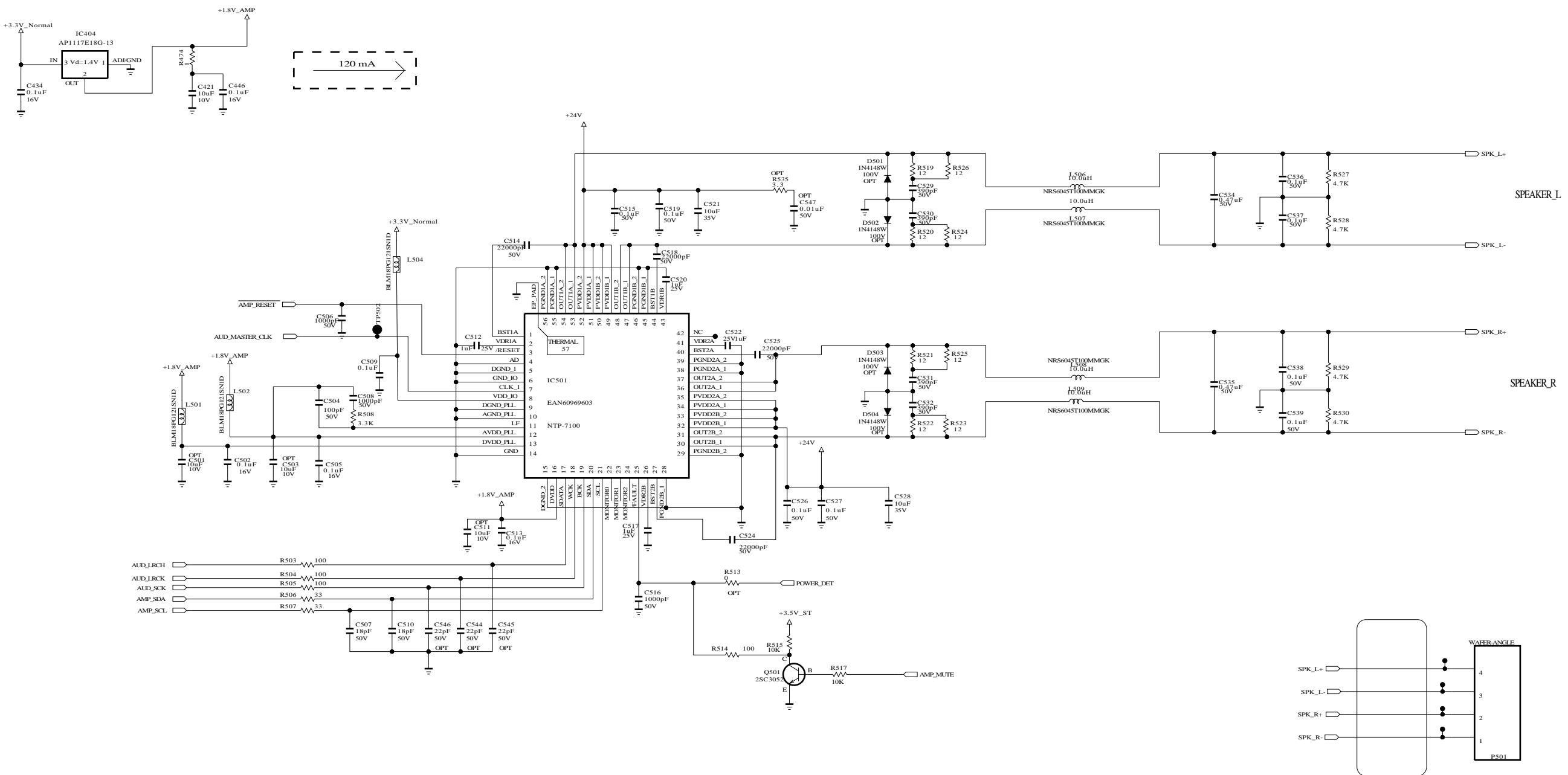


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LG Electronics

LG ELECTRONICS

MODEL	GP2R	DATE	20101023
BLOCK	WOOFER_NTE	SHEET	15 /

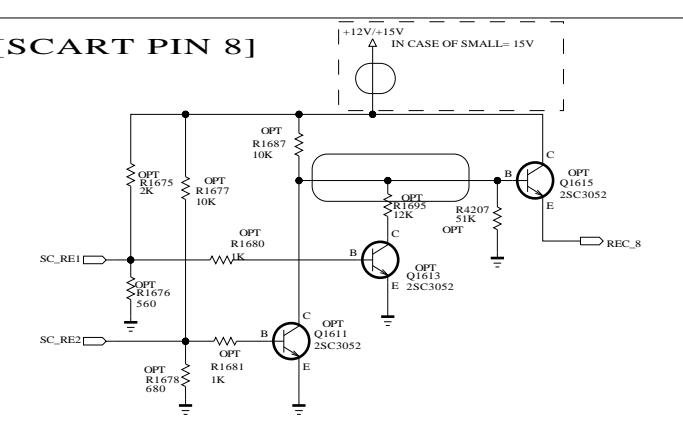
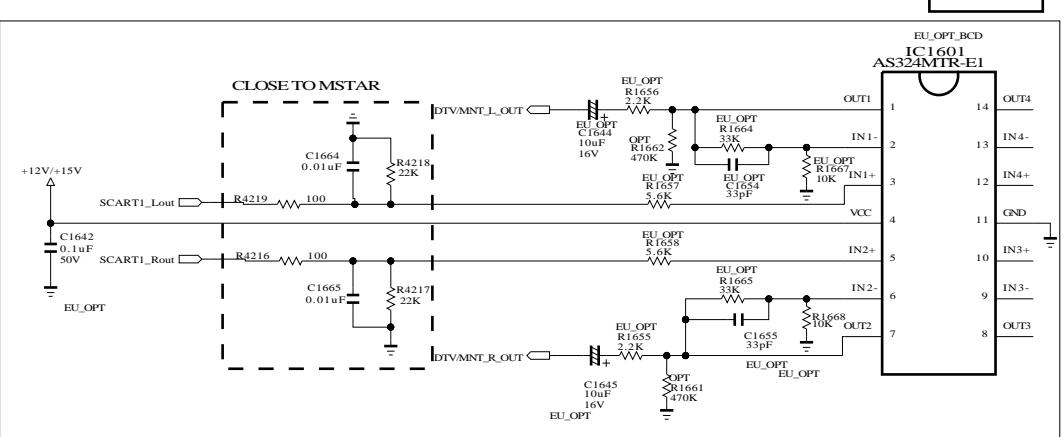
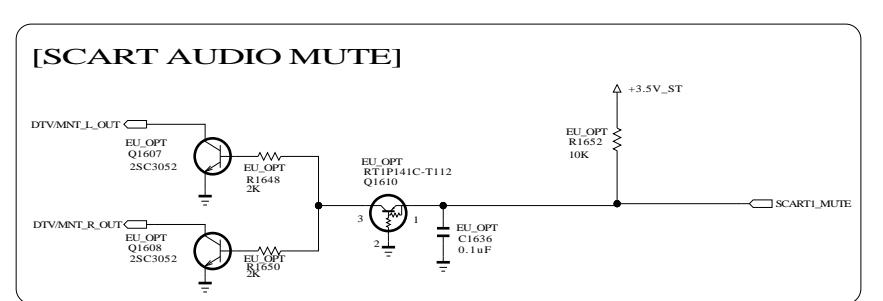
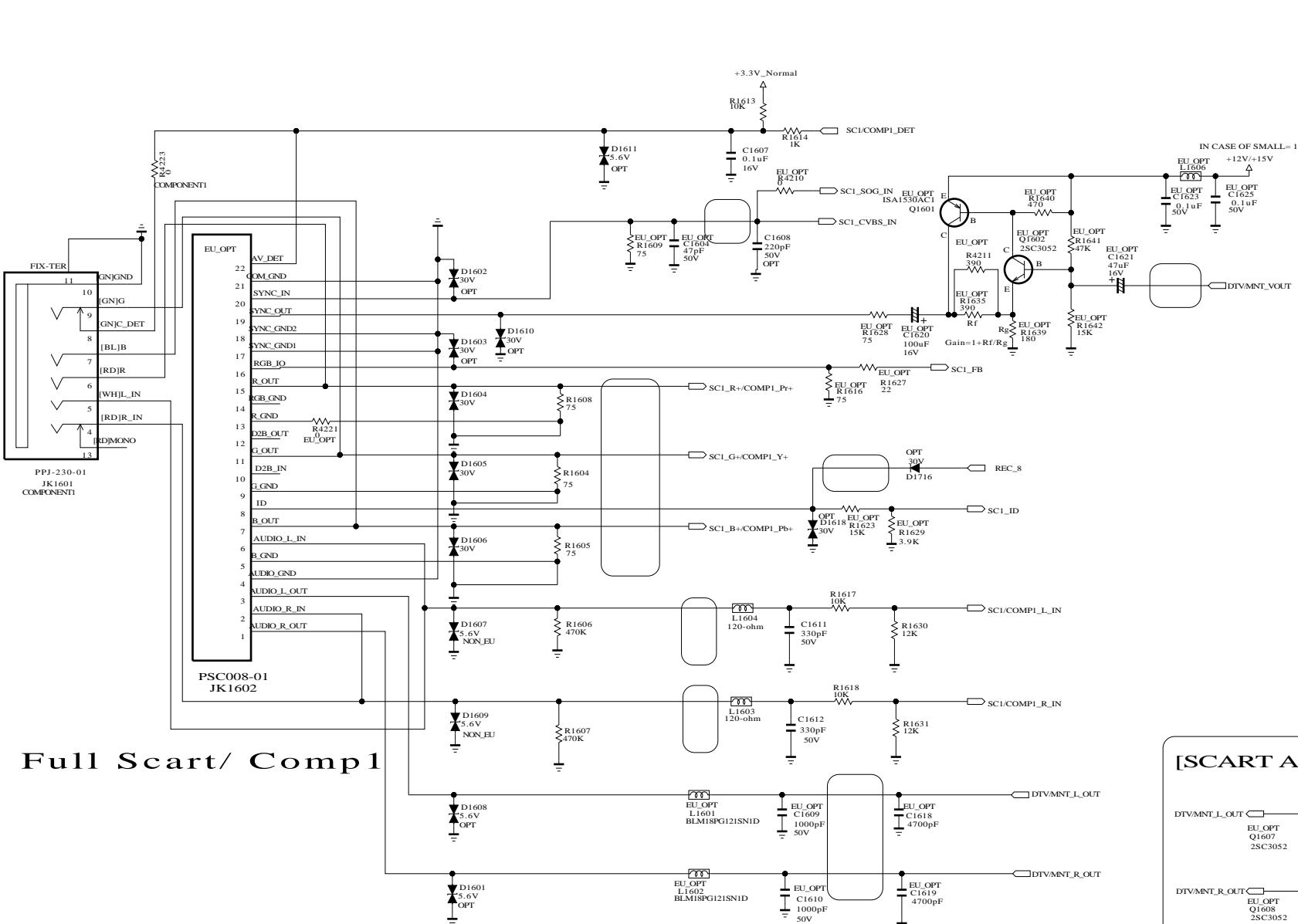
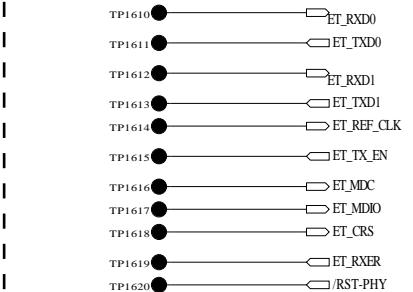
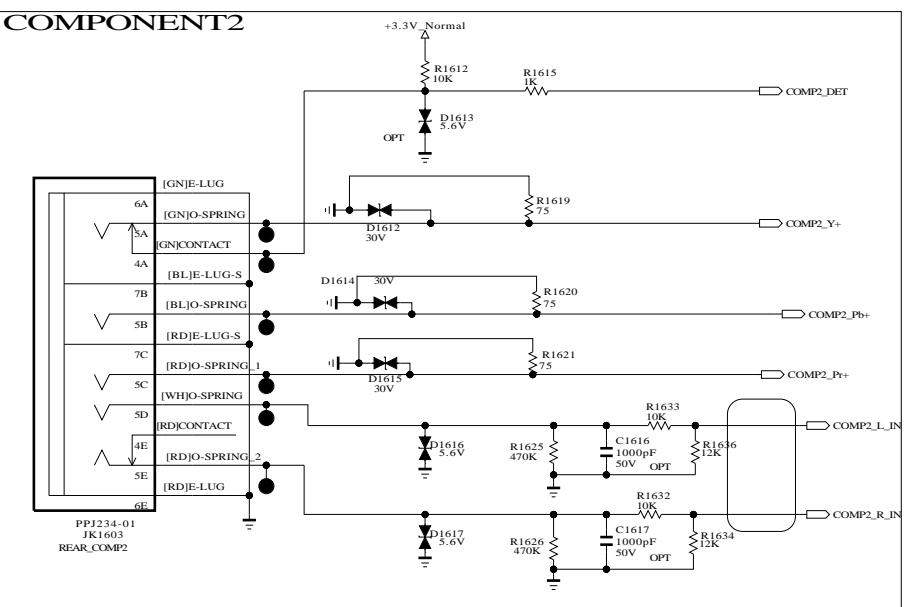
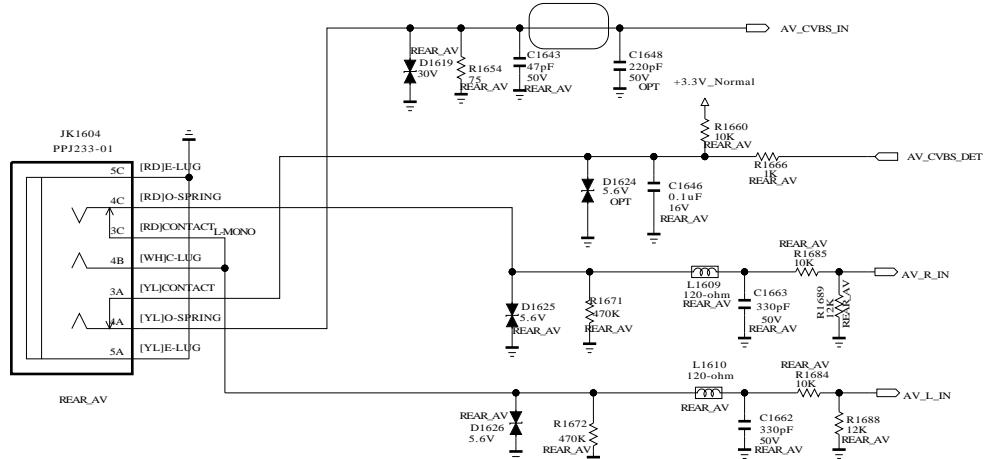


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LG ELECTRONICS

MODEL	GP2R	DATE	20101023
BLOCK	AMP_NTP	SHEET	16



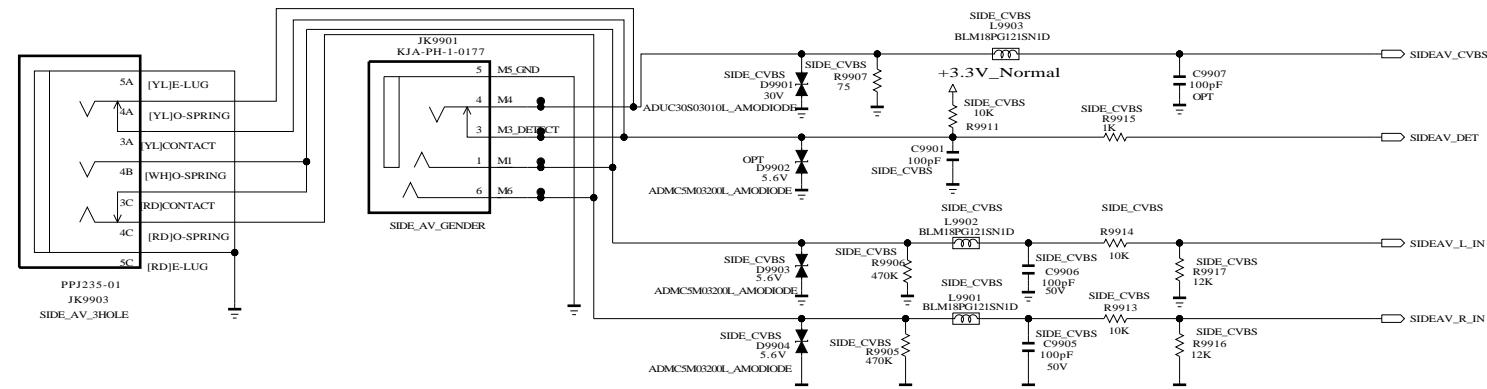
THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC

SECRET

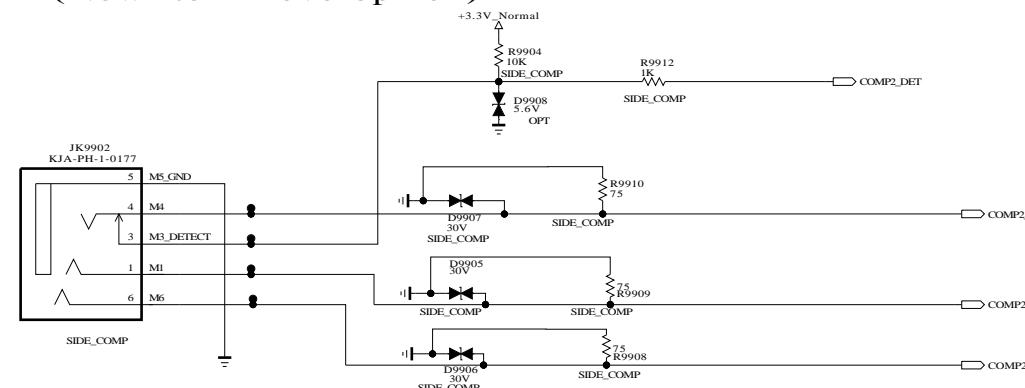
LG ELECTRONICS

MODEL	GP2R	DATE	20101023
BLUETOOTH	EAR JACK	SHEET	13 /

**SIDE CVBS PHONE JACK**  
(New Item Development)



**SIDE COMPONENT PHONE JACK**  
(New Item Development)



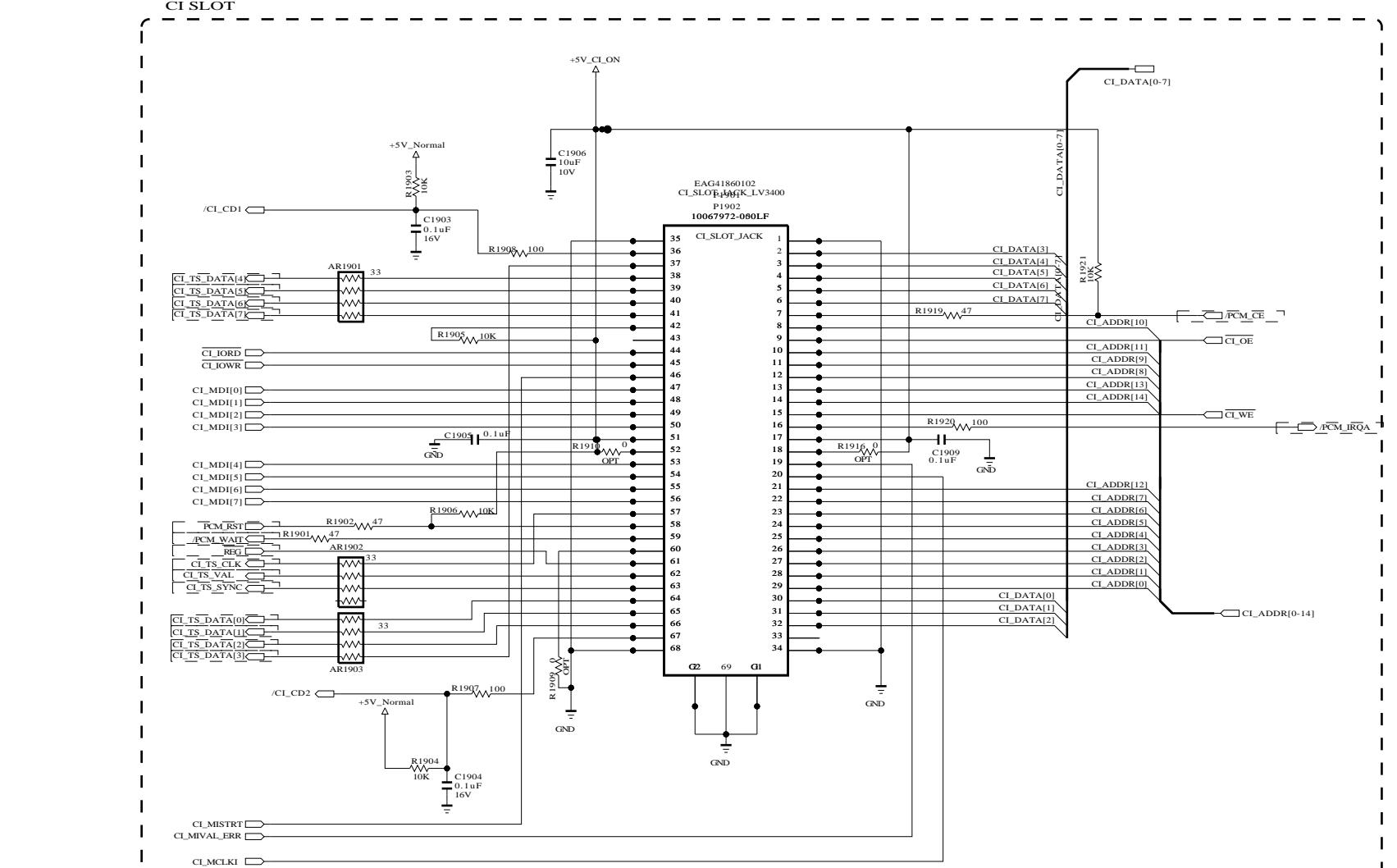
THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. IT IS ESSENTIAL THAT ONLY MANUFACTURED SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.

SECRET  
LG Electronics

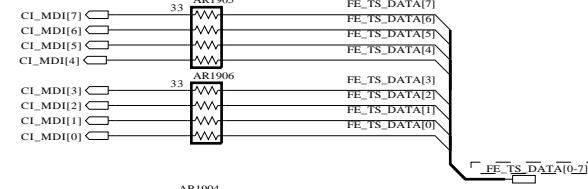
LG ELECTRONICS

MODEL	GP2R	DATE	20101023
BLOCK	SIDE_JACK	SHEET	18 /

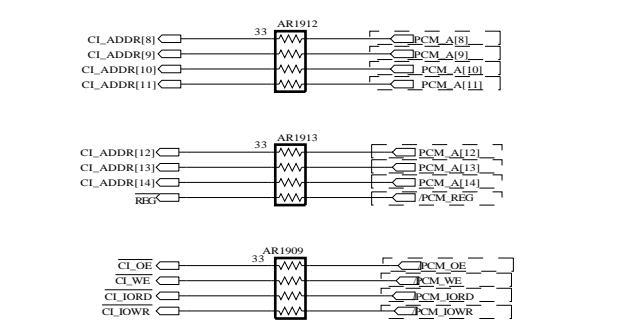
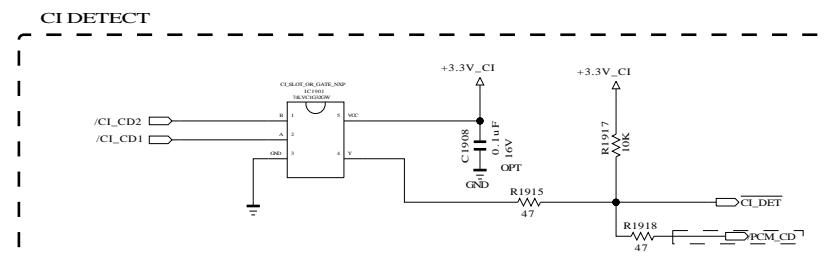
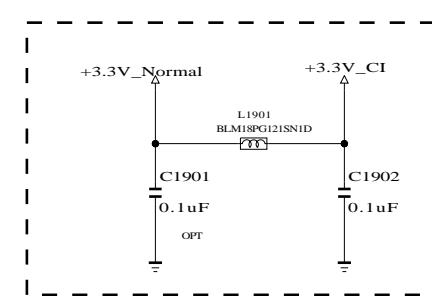
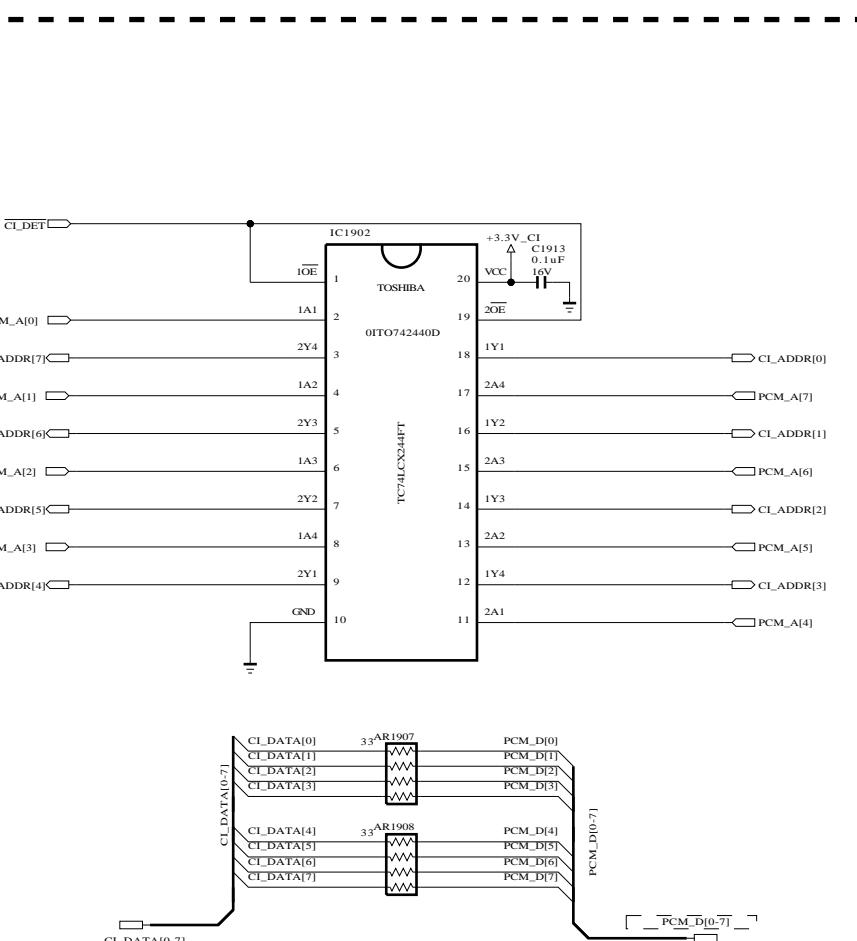
## CI Region



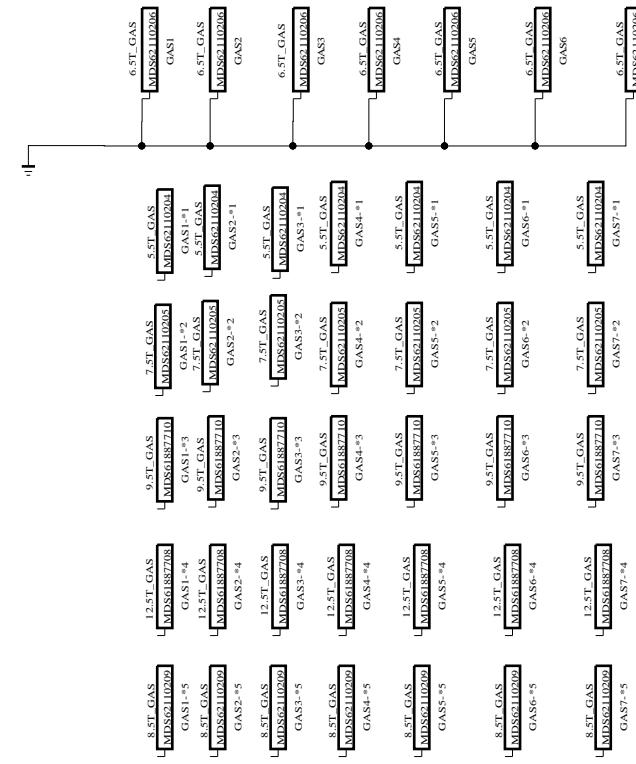
## CI TS INPUT



## CI HOST I/F



## SMD GASKET

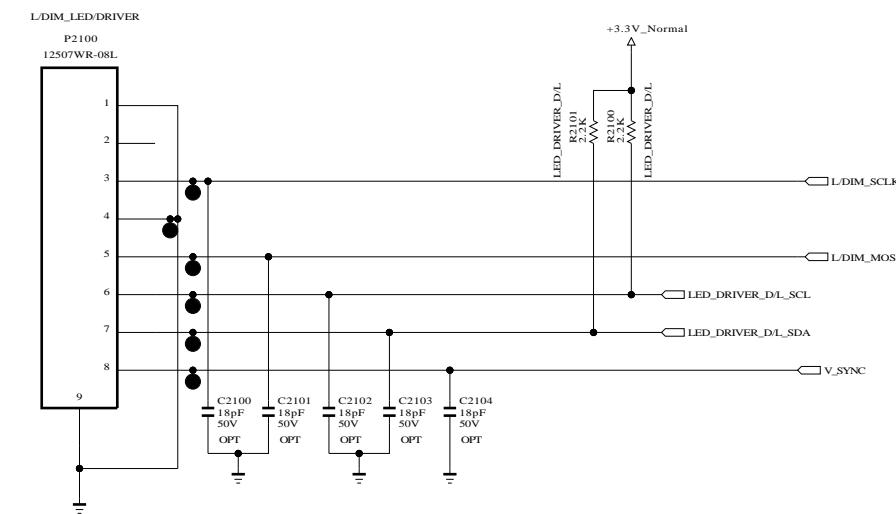


THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. IT IS ESSENTIAL THAT ONLY MANUFACTURED SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.

SECRET  
LG Electronics

LG ELECTRONICS

MODEL	GP2R	DATE	20101023
BLOCK	SMD_GAS	SHEET	20 /

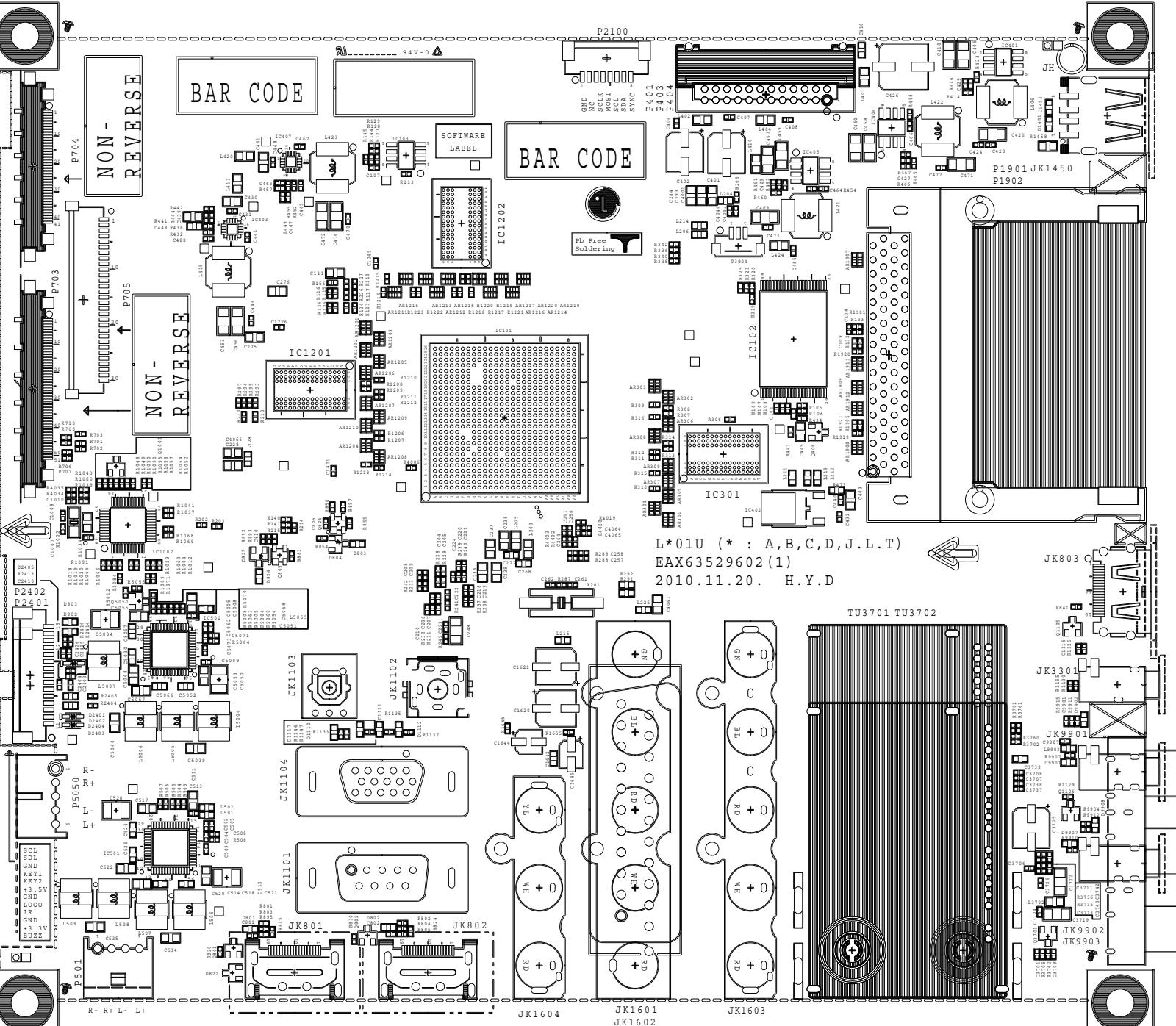


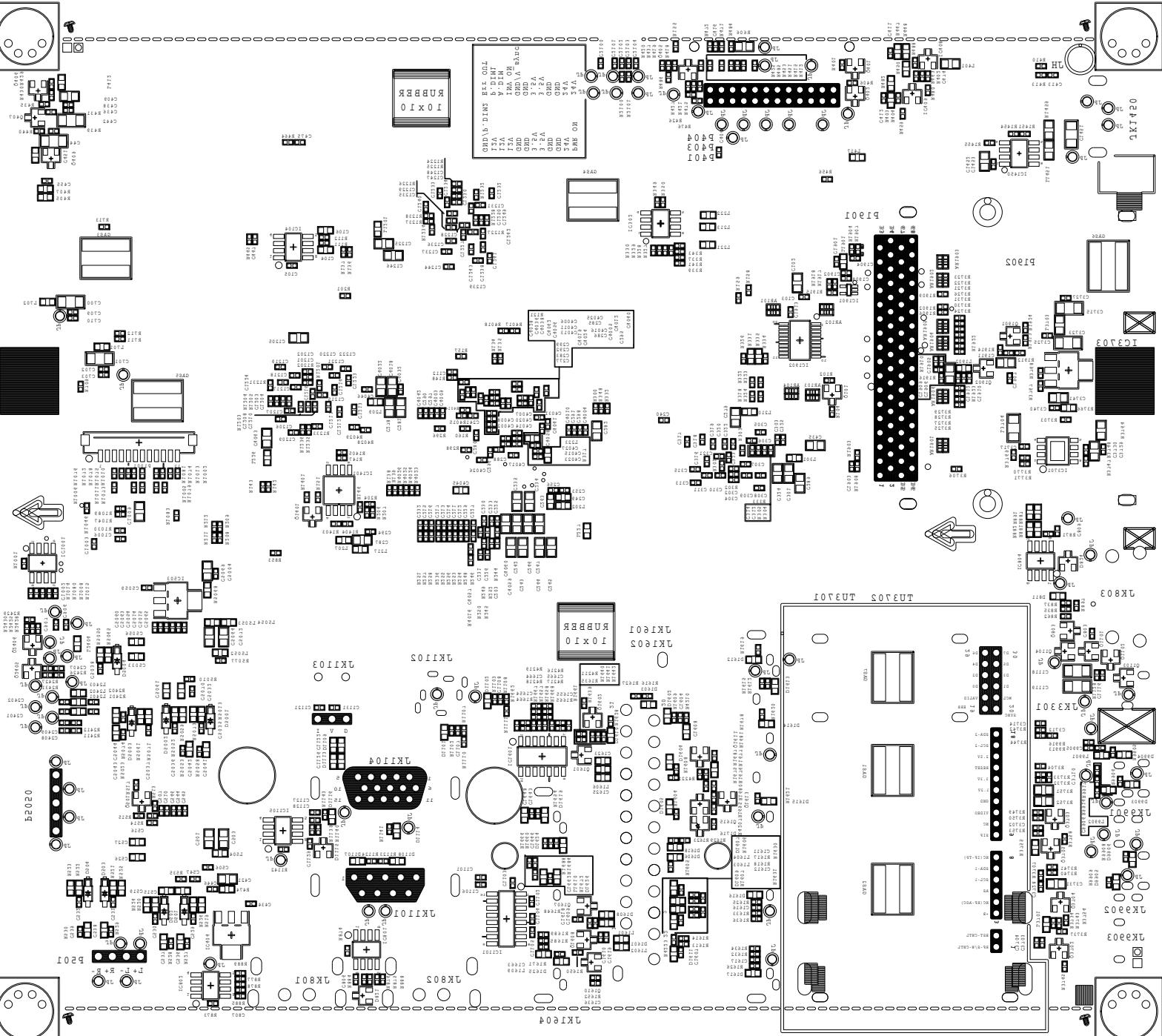
THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. IT IS ESSENTIAL THAT ONLY MANUFACTURED SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.

SECRET
LGElectronics

LG ELECTRONICS

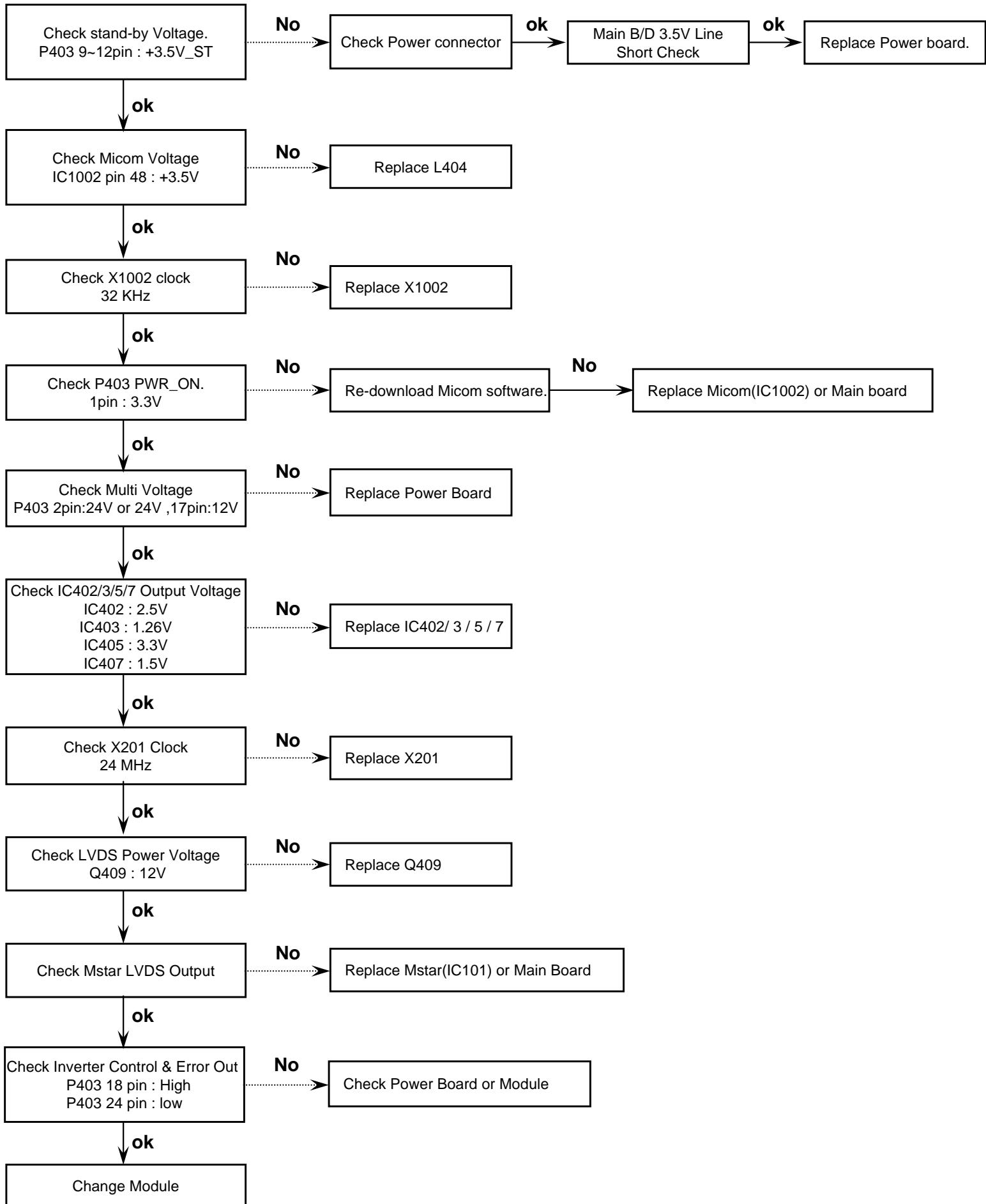
MODEL	GP2R	DATE	20101023
BLOCK	L/DIM_LED	SHEET	21 /



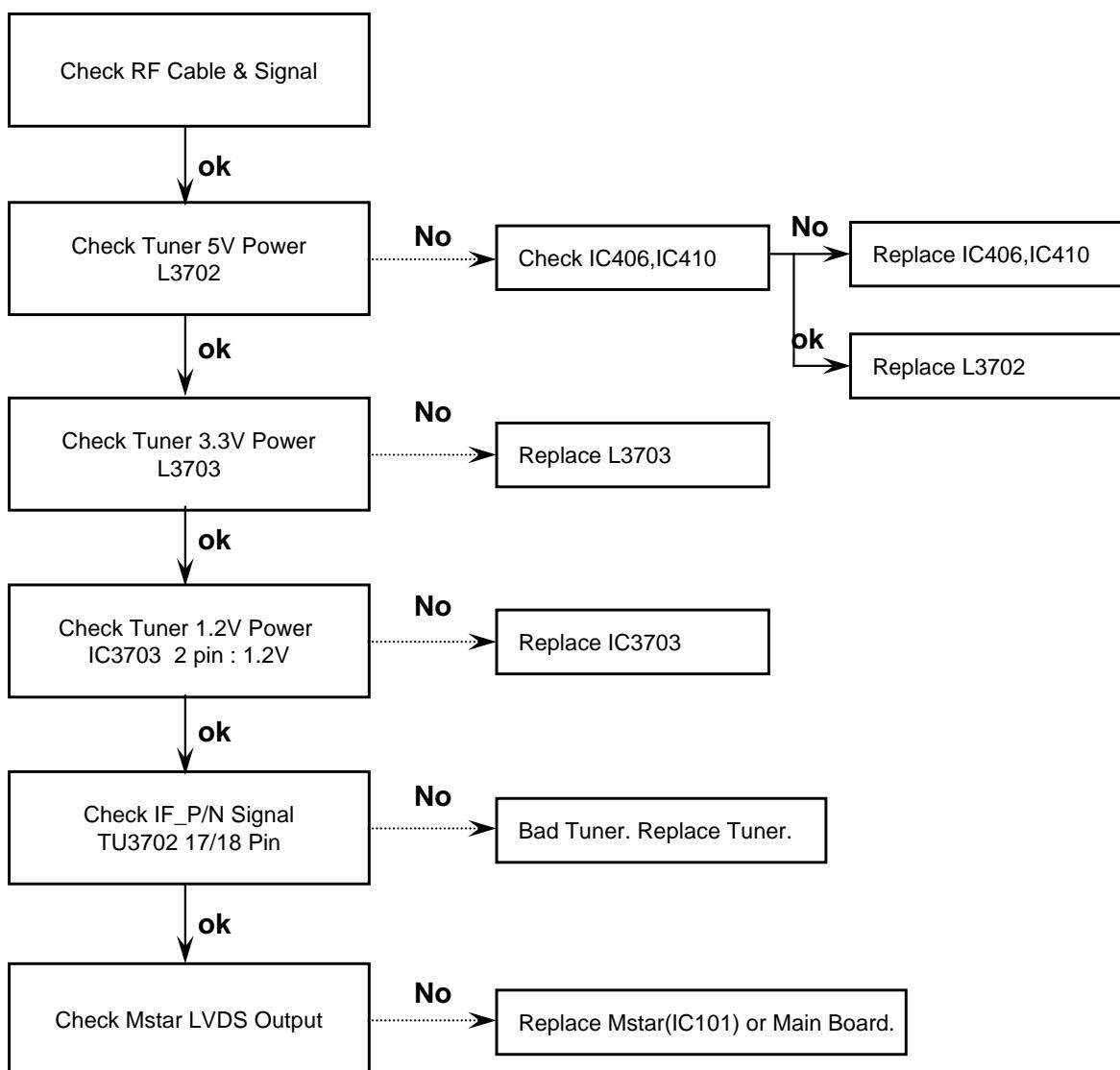




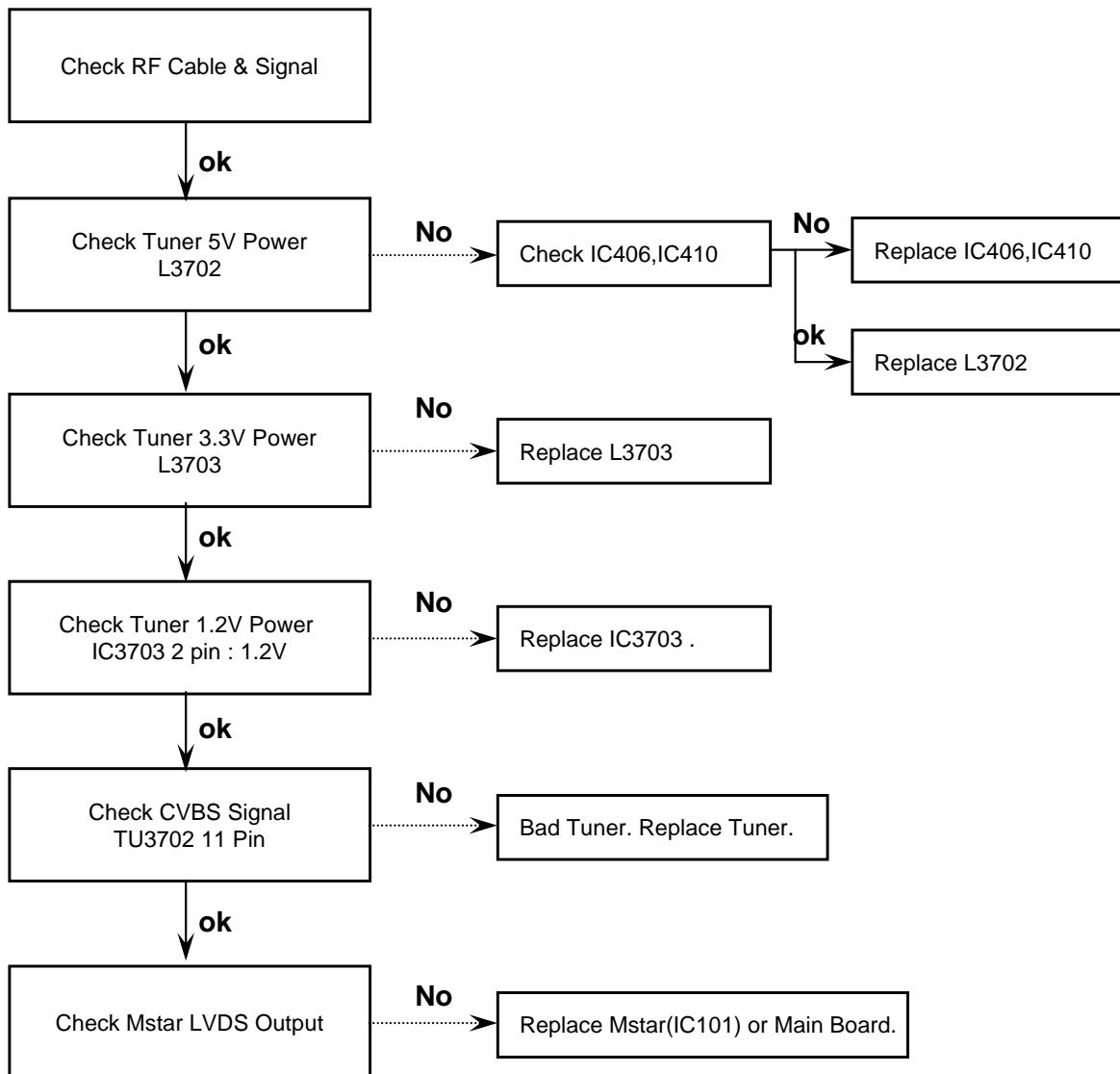
# 1. Power-up boot check



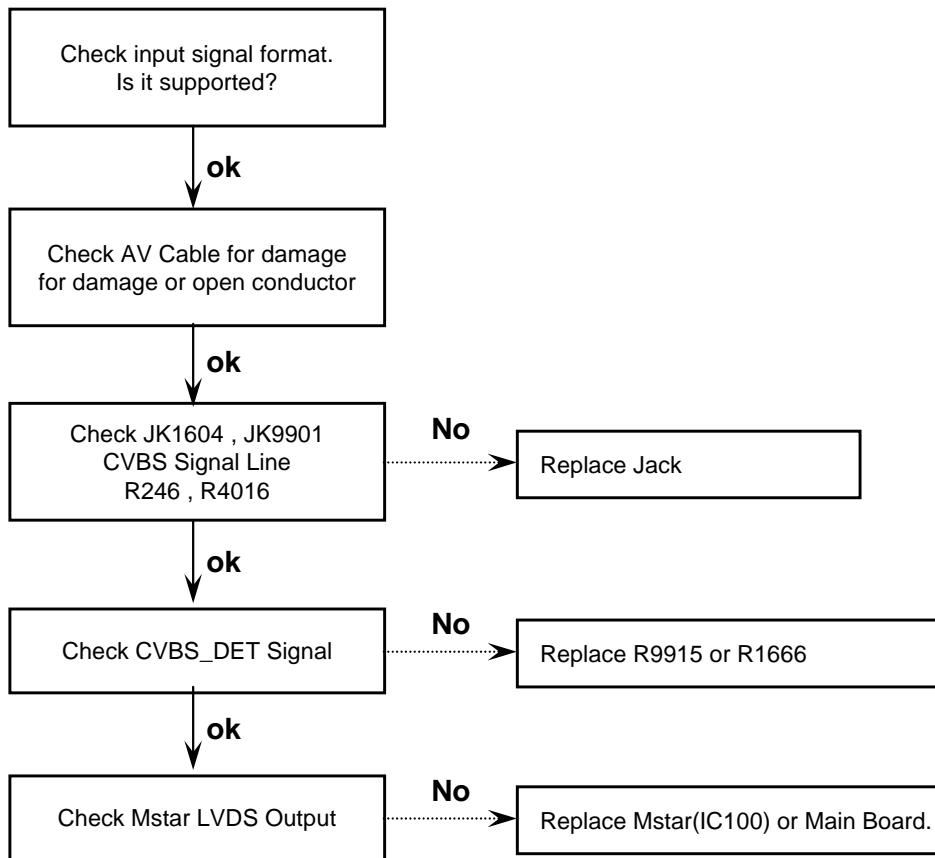
## 2. Digital TV Video



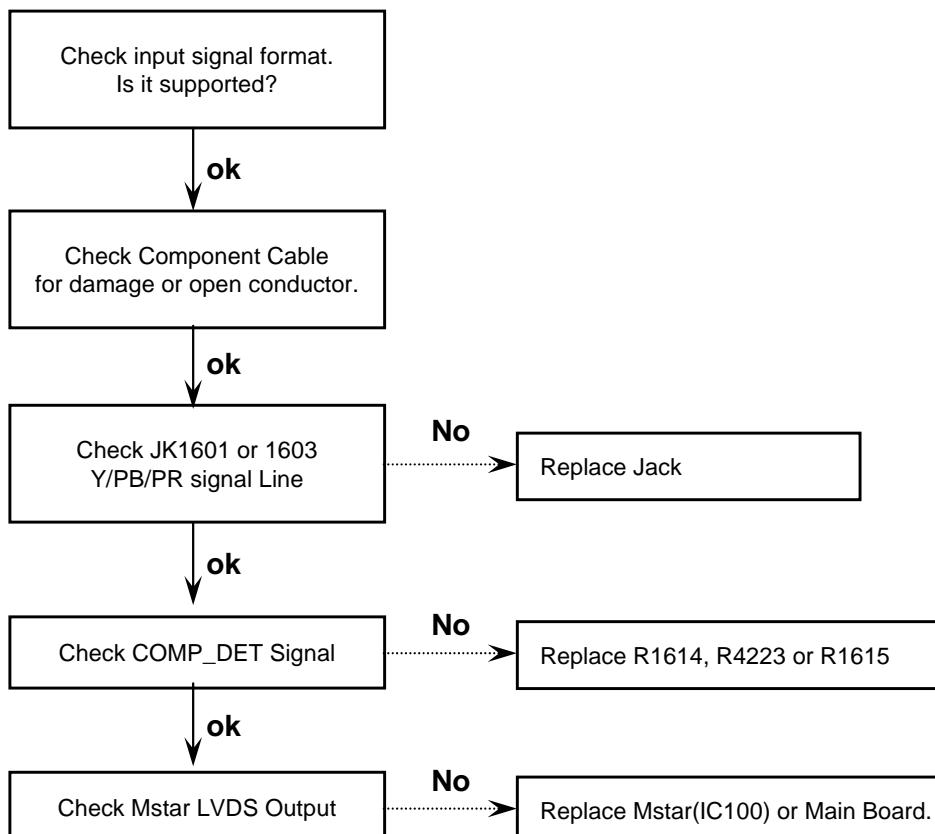
### 3. Analog TV Video



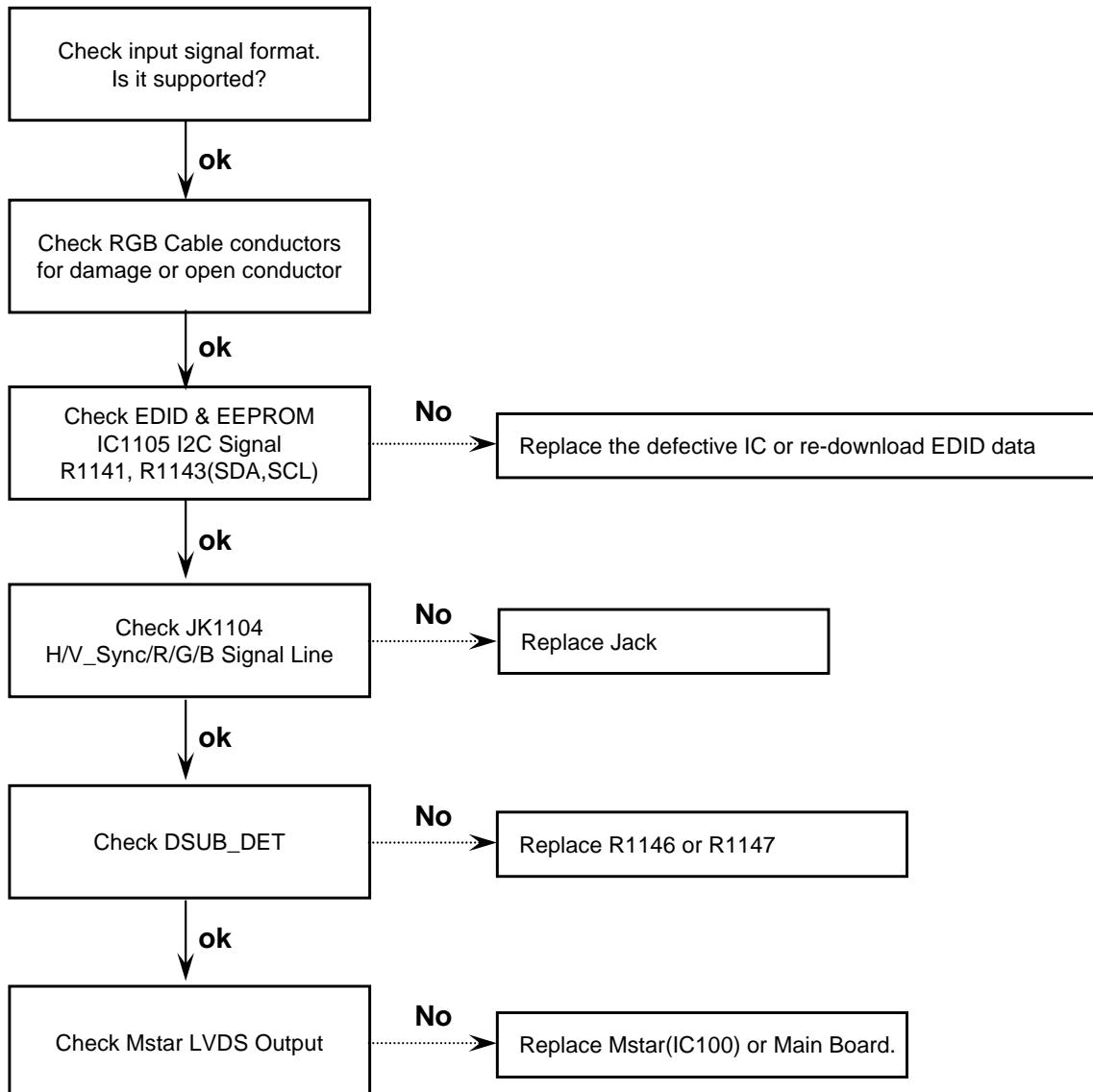
## 4. AV Video



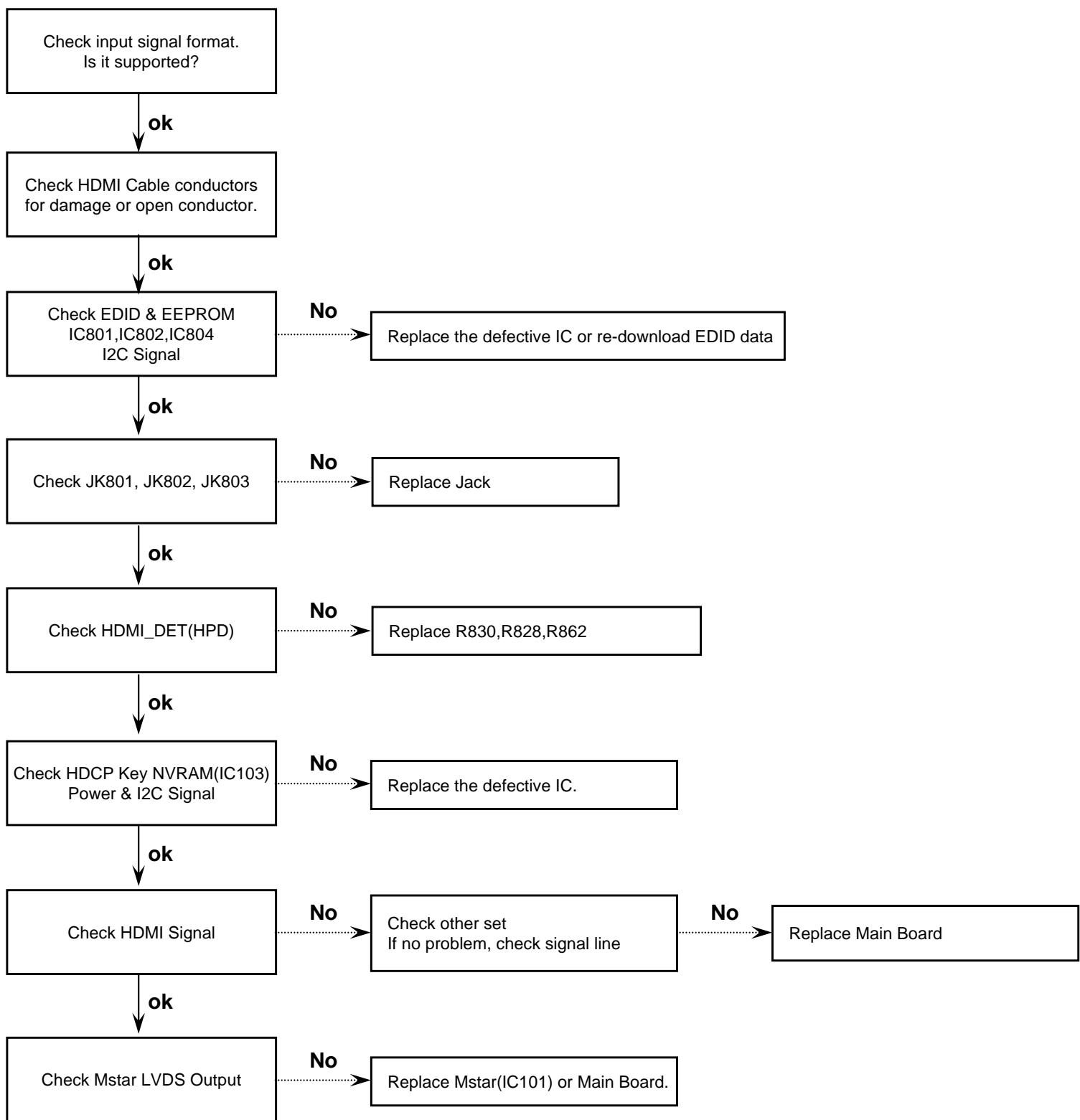
## 5. Component Video



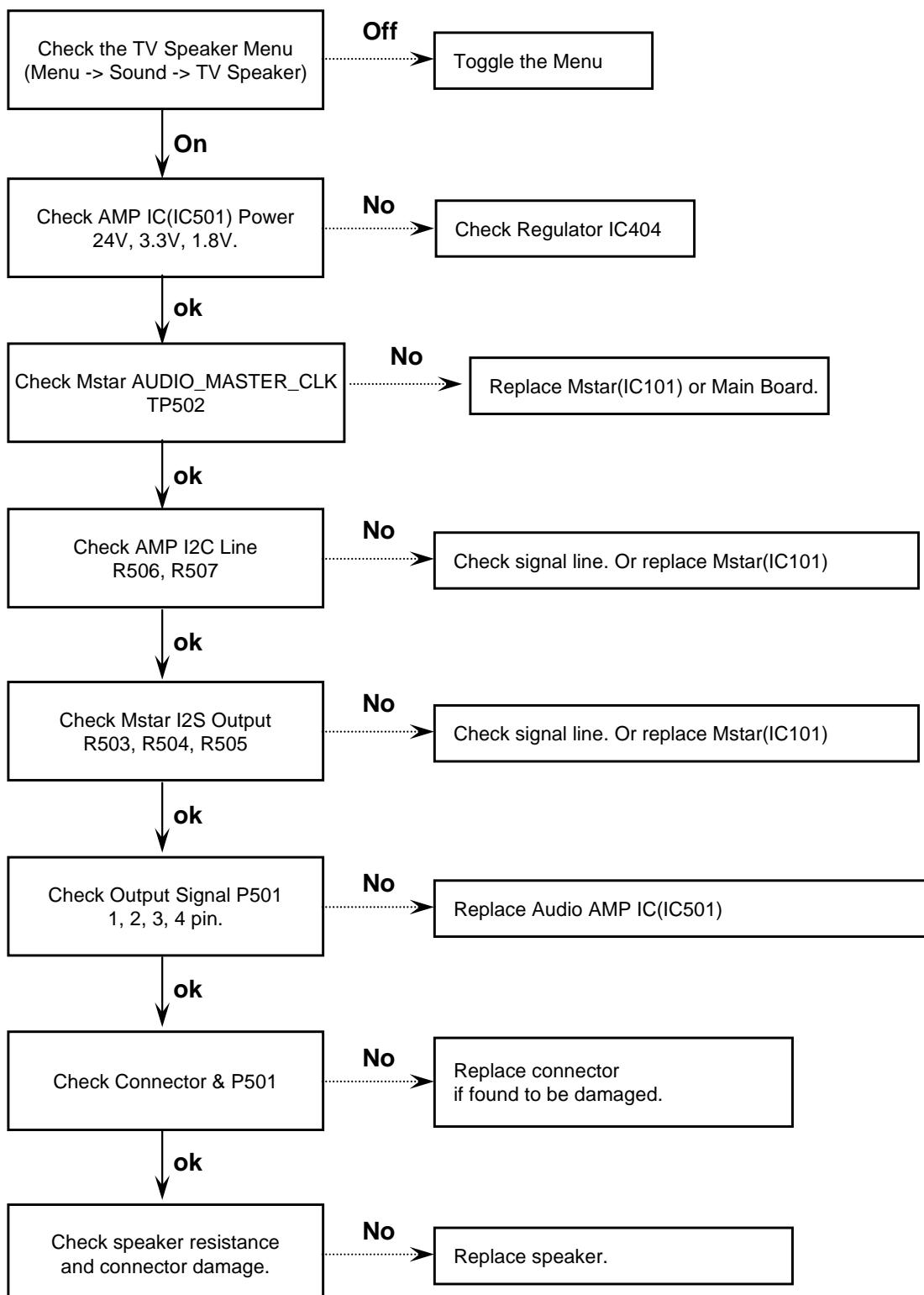
## 6. RGB Video



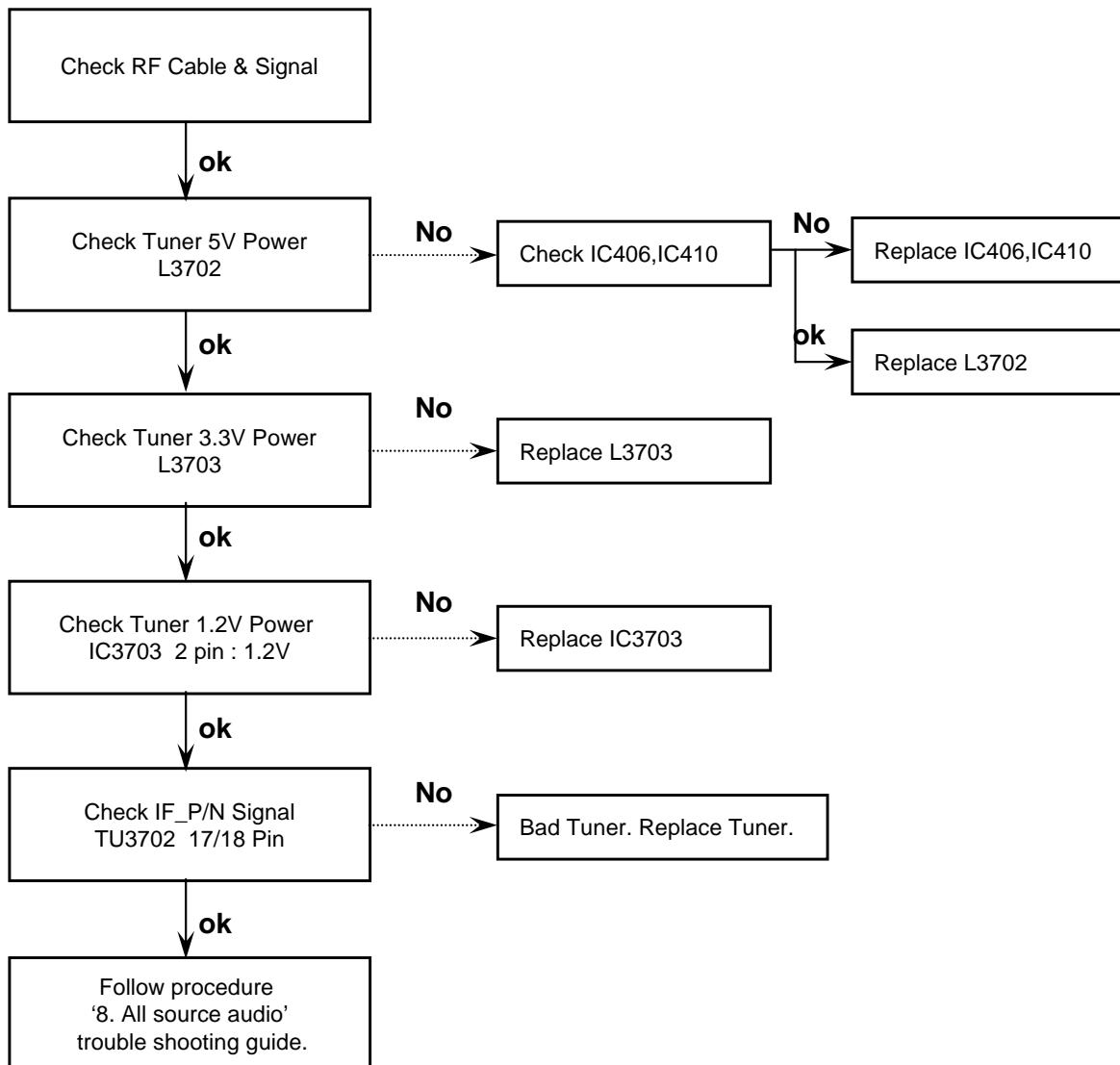
## 7. HDMI Video



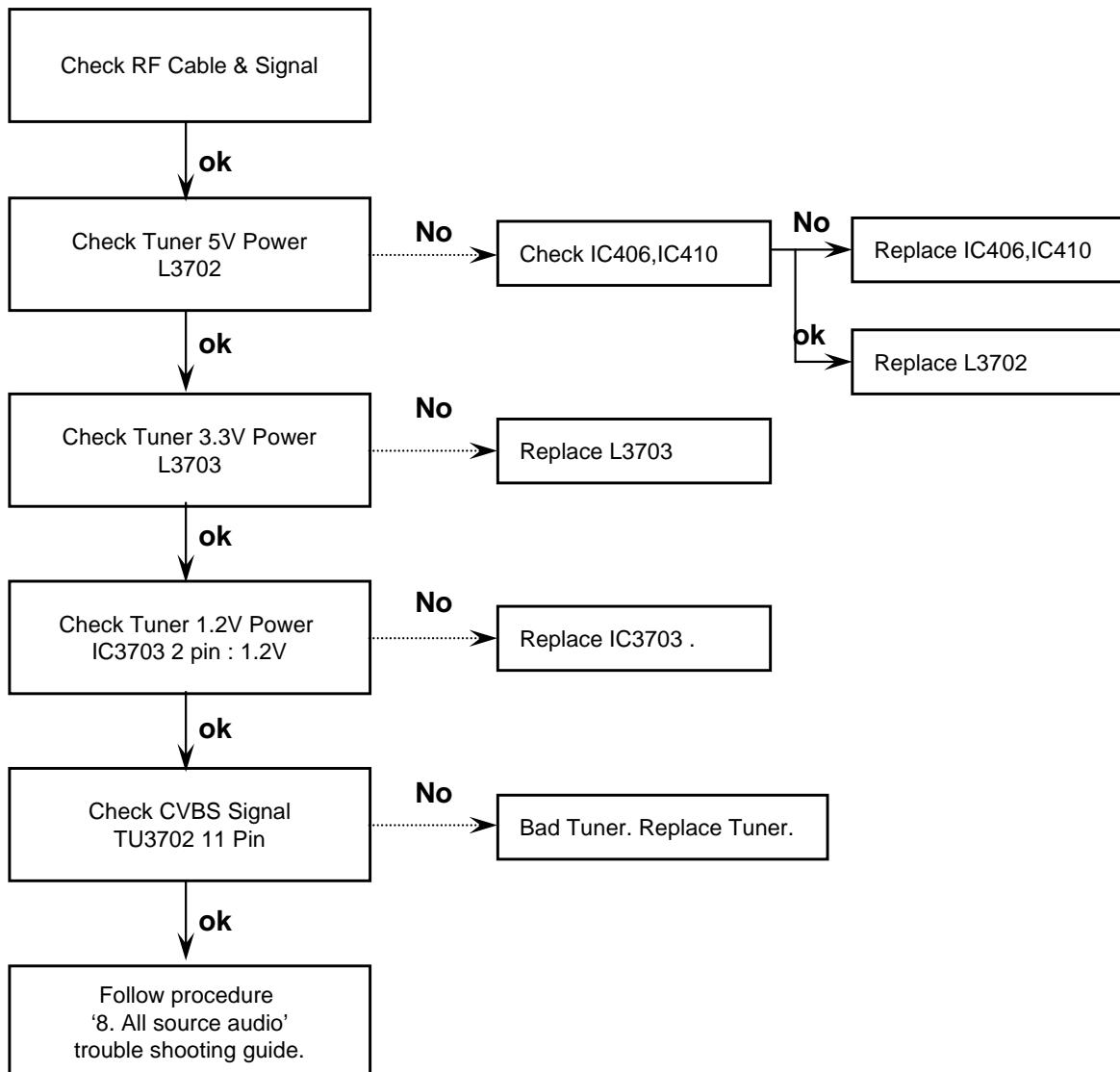
## 8. All Source Audio



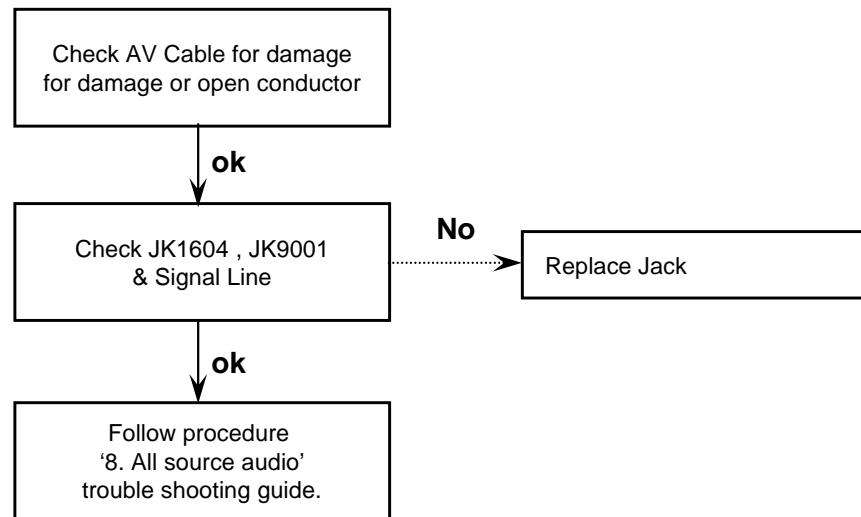
## 9. Digital TV Audio



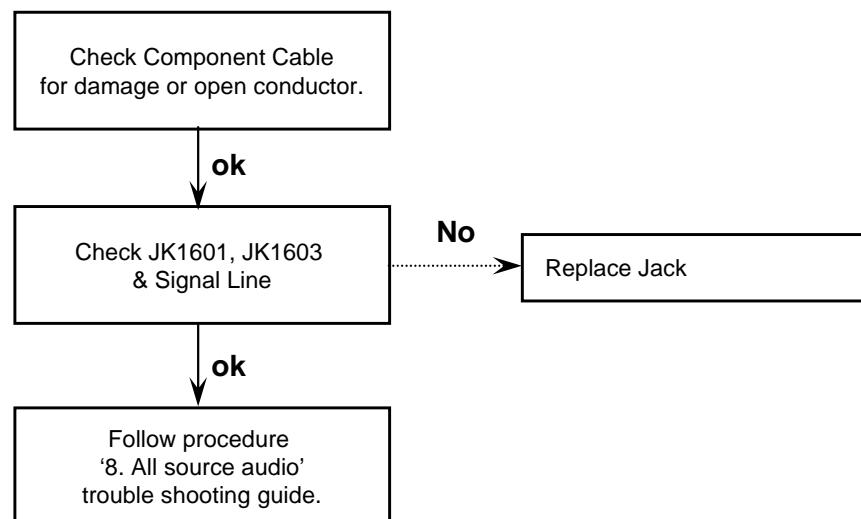
## 10. Analog TV Audio



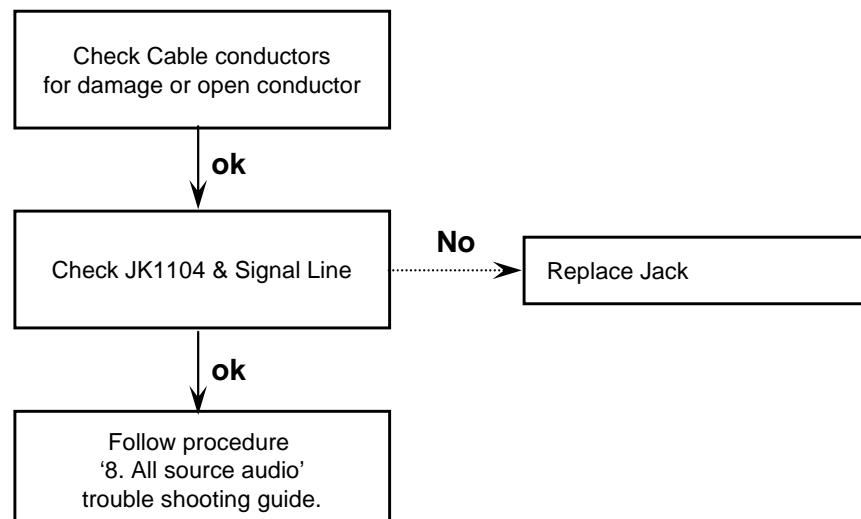
## 11. AV Audio



## 12. Component Audio



## 13. RGB Audio



# GP3 Carry Over 모델 Block Diagram



LG Electronics / LCD TV 연구소  
연구 1실 / AT1 그룹

